This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

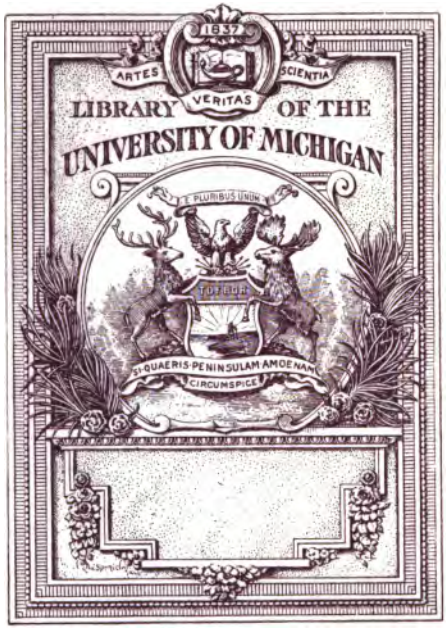
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

A 413878


1837
ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
TURGUR
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE

Mail

CHARLES F. HAMILTON.

THE OHIO STATE MEDICAL ASSOCIATION

TRANSACTIONS

OF THE

FIFTY-NINTH ANNUAL MEETING

HELD AT

CLEVELAND, OHIO

MAY 18, 19 AND 20, 1904

CLEVELAND
PRESS OF J. B. SAVAGE
1904

THE

SIXTIETH ANNUAL MEETING

OF THE

OHIO STATE MEDICAL ASSOCIATION

WILL BE HELD AT

COLUMBUS, 1905

OFFICERS

OHIO STATE MEDICAL ASSOCIATION

President.....S. S. Halderman, Portsmouth
First Vicepresident.....J. A. Dickson, Ashtabula
Second Vicepresident.....J. S. Deamy, Bellefontaine
Third Vicepresident.....W. E. Morris, Lisbon
Fourth Vicepresident.....A. H. McCullough, Mansfield
Secretary.....Frank Winders, Columbus
Treasurer.....James A. Duncan, Toledo

COMMITTEES

SCIENTIFIC WORK

Frank Winders, Secretary, Chairman.....Columbus
B. H. Blair.....Lebanon
John G. Kellar.....Toledo

PUBLICATION

Frank Winders, Secretary, Chairman.....Columbus
A. P. Ohlmacher.....Gallipolis
C. F. Clark.....Columbus

PUBLIC POLICY AND LEGISLATION

Thomas Charles Martin, Chairman.....Cleveland
R. T. Trimble.....New Vienna
N. P. Dandridge.....Cincinnati
S. S. Halderman, President.....Portsmouth
Frank Winders, Secretary.....Columbus

STATE PATHOLOGIC INSTITUTE

E. J. Wilson, Chairman.....Columbus
A. P. Ohlmacher.....Gallipolis
A. B. Howard.....Cleveland
Julius H. Jacobson.....Toledo
F. W. Langdon.....Cincinnati

COUNCILORS

Horace Bonner, one year.....Dayton
J. C. M. Floyd, one year.....Steubenville
Frank D. Bain, two years.....Kenton
E. C. Brush, two years.....Zanesville
Julius H. Jacobson, three years.....Toledo
John E. Sylvester, three years.....Wellston
Thomas Charles Martin, four years.....Cleveland
T. W. Rankin, four years.....Columbus
Brooks F. Beebe, five years.....Cincinnati
T. Clarke Miller, five years.....Mansfield

178656

Ohio State Medical Society

At the Eighteenth Annual Meeting of the Ohio State Medical Society, the following resolution was adopted:

Resolved, That the publication of any address, prize essay, or other paper, by this Society, is no evidence of its endorsement of the sentiments therein contained.

TABLE OF CONTENTS

CHAPTER I—MINUTES

Minutes of the House of Delegates 9
Minutes of the General Meeting 31
Minutes of the Medical Section 33
Minutes of the Surgical Section 34

CHAPTER II—ADDRESSES

The Surgery of the Prostate—G. Frank Lydston, M. D., Chicago, Ill. 37
Address of the President—Charles S. Hamilton, M. D., Columbus 54

CHAPTER III—MEDICINE

Syphilis of the Stomach—Charles F. Hoover, M. D., Cleveland 61
Some Observations by a General Practitioner—H. B. Gibbon, M. D., Tiffin 65
The Open Air Treatment of Tuberculosis in Northern Ohio—John P. Sawyer, M. D., Cleveland 71
Some Observations on Climatic Changes in Respiratory Diseases —T. N. B. Whiteleather, M. D., Malvern 82
Diabetes Mellitus, With Especial Reference to Etiology—George F. Zinninger, M. D., Canton 89
Natural and Artifical Immunity—J. Robert Caywood, M. D., Piqua 98
Some Unusual Manifestations of Influenza—Charles H. Higgins, M. D., Sonora 104
Migraine—D. N. Kinsman, M. D., Columbus 113
The Plea of Insanity—R. H. Grube, M. D., Grape Grove..... 128
Dilated Heart—D. C. Houser, M. D., Millerstown 133
Idiopathic Cardiac Dilatation—G. A. Fackler, M. D., Cincinnati 143

Carcinomatous Transformation of Ulcer of the Stomach—John Dudley Dunham, M. D., Columbus 158
Gastrectasia, Its Clinical Significance and Treatment—D. B. Conklin, M. D., Dayton 165
Habit—C. D. Mills, M. D., Marysville 173
Some Therapeutic Needs—J. C. Larkin, M. D., Hillsboro..... 186

CHAPTER IV—SURGERY

Treatment (*a*) of Diffuse Suppurative Peritonitis Following Appendicitis; (*b*) of Intestinal Obstruction Following Laparotomy—Dudley P. Allen, M. D., Cleveland 200
Contracture of the Neck of the Bladder—T. G. Youmans, M. D., Columbus 216
Meckel's Diverticulum—Frank E. Bunts, M. D., Cleveland..... 224
Traumatic Ostitis of the Ulna and Treatment by Operation—Joseph Robertson, M. D., Steubenville 245
A Resume of Clinical Results of Operations on the Kidneys, With a Report on the Newer Methods of Diagnosis—William E. Lower, M. D., Cleveland 249
Some Considerations of Empyema—Mark Millikin, M. D., Hamilton 263
The Diagnosis and Treatment of Hernia—Jesse McClain, M. D., Coshocton 269
Contusions of the Abdomen—C. A. Hamann, M. D., Cleveland.. 277
Pancreatitis—William J. Gillette, M. D., Toledo..... 286
Acute Hemorrhagic Pancreatitis, with Report of a Case—J. H. J. Upham and Isabel A. Bradley, M. D., Columbus..... 291
Cocain Anesthesia in General Surgery—W. J. Means, M. D., Columbus 307
The Relation Between Typhoid Fever and Appendicitis—N. Stone Scott, M. D., Cleveland 318
Sacral Teratoma—Lester Kellar, M. D., Ironton 327

CHAPTER V—EYE, EAR, NOSE AND THROAT

Acute Otogenous Temporosphenoidal Abscess; Diagnosis and Method of Operating—Thomas Hubbard, M. D., Toledo... 331
Three Recent Cases of "Croup" Due to Staphylococcus and Requiring Tracheotomy—F. P. Anzinger, M. D., Springfield.. 342

CHAPTER VI—OBSTETRICS AND GYNECOLOGY

Practical Deductions from Some Personal Experiences with Ectopic Pregnancy—R. E. Skeel, M. D., Cleveland..... 352
Conservatism in Pelvic Surgery—Hunter Robb, M. D., Cleveland. 367
Retroversion—J. C. Tritch, M. D., Findlay 374
Pregnancy Complicated by Fibroid—C. L. Bonifield, M. D., Cincinnati 378
The Need of More Careful Work in Obstetrics—F. W. Lane, M. D., Cambridge 383

CHAPTER VII—UNCLASSIFIED

Fifty Years in Medicine—John D. West, M. D., Hopedale..... 388
Modern Medicine—D. W. McQueen, M. D., Camden..... 404
Experimental Inquiry into the Causation of Caisson Disease with Remarks on Its Prevention and Treatment—J. J. R. MacLeod, M. D., Cleveland 408
A Neglected Factor in a Medical Problem—David R. Silver, M. D., Sidney 417
Neglected Little Things—R. S. Reid, M. D., Bucyrus..... 423
Nervous Phenomena and Local Disease—The Question of Surgical Intervention—E. S. Stevens, M. D., Lebanon..... 427
Radium and Radioactivity—Myron Metzenbaum, M. D., Cleveland 432

CHAPTER VIII

Members and Delegates, Registered at Cleveland..... 442
Component Societies, with Officers only..... 449
Membership List 453

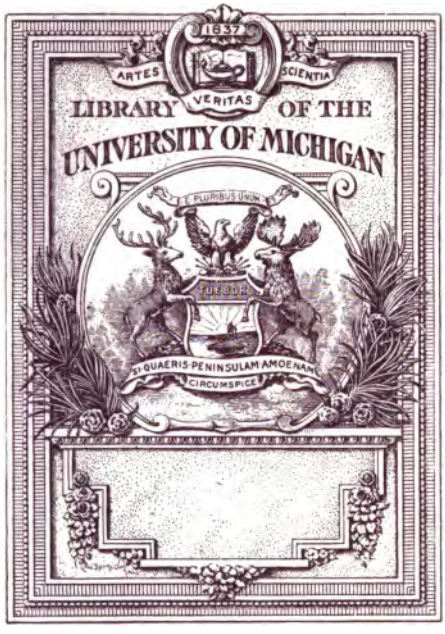
CHAPTER I—MINUTES

MEETING OF THE HOUSE OF DELEGATES

WEDNESDAY MORNING, MAY 18, 1904

Meeting called to order by the President, Charles S. Hamilton, at 11:00 a. m. Roll call of delegates present resulted as follows:

Ashtabula	County	F. D. Case	Ashtabula
Brown	"	Y. Stephenson	Georgetown
Butler	"	Mark Millikin	Hamilton
Carroll	"	W. R. Spratt	Malvern
Clinton	"	R. T. Trimble	New Vienna
Coshocton	"	J. D. Lower	Bunkerville
Cuyahoga	"	W. E. Bruner	Cleveland
Cuyahoga	"	F. E. Bunts	Cleveland
Cuyahoga	"	M. Rosenwasser	Cleveland
Cuyahoga	"	G. W. Moorehouse	Cleveland
Erie	"	Chas. Graefe	Sandusky
Franklin	"	D. L. Moore	Columbus
Gallia	"	R. W. Holmes	Gallipolis
Green	"	R. H. Grube	Grape Grove
Hamilton	"	Mark A. Brown	Cincinnati
Hamilton	"	C. L. Bonifield	Cincinnati
Hamilton	"	C. A. L. Reed	Cincinnati
Hamilton	"	Louis Schwab	Cincinnati
Hardin	"	E. S. Protzman	Kenton
Highland	"	J. C. Larkin	Hillsboro
Hocking	"	A. K. Smith	Logan
Jefferson	"	W. H. Wood	Smithville
Knox	"	F. C. Larimore	Mt. Vernon
Lawrence	"	W. F. Marting	Ironton
Logan	"	C. E. Huston	Rushsylvania
Lorain	"	E. Campbell	Lorain
Madison	"	Andrew Rogers	West Jefferso


1837
ARTES
SCIENTIA
VERITAS
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE

610.5
Op1
Sc

Mau

The above nominations were all seconded by B. F. Beebe.

G. W. Moorehouse moved that the Secretary be instructed to cast the ballot for the nominations as made.

This motion was duly seconded and carried.

F. D. Bain moved that the meeting adjourn, but motion was lost.

Nomination and Election of Committee on Scientific Work was then taken up, and T. C. Martin moved that the Committee of the past year be continued for another year.

This motion was seconded and carried.

Nomination and Election of Committee on Public Policy and Legislation was then taken up.

Horace Bonner moved that the same Committee be continued for the coming year. Seconded and carried.

Next, the Nomination and Election of Committee on Publication was taken up.

G. W. Moorehouse moved that the present Committee be renominated and re-elected. Seconded and carried.

T. W. Rankin moved that the meeting adjourn. Carried.

Wednesday Evening, May 18, 1904

Meeting called to order by President, Charles S. Hamilton, at 8:30 p. m.

The minutes of the morning session were read by the Secretary. No objections being made, the President ordered them recorded as read.

Horace Bonner requested that the Secretary again call the roll as several delegates had arrived since the last session.

Roll call showed following delegates present:

[illegible]	A. S. Rudy	Lima
[illegible]	J. D. Case	Ashtabula
[illegible]	B. C. Cope	Barton
[illegible]	V. Stephenson	Georgetown
[illegible]	Mark Millikin	Hamilton

Carroll County	.....	W. R. Spratt	Malvern
Clark "	.....	F. P. Anzinger	Springfield
Clinton "	.....	R. T. Trimble	New Vienna
Columbiana "	.....	W. H. Hobbs	East Liverpool
Cuyahoga "	.....	W. E. Bruner	Cleveland
Cuyahoga "	.....	F. E. Bunts	Cleveland
Cuyahoga "	.....	M. Rosenwasser	Cleveland
Cuyahoga "	.....	G. W. Moorehouse	Cleveland
Erie "	.....	Chas. Graefe	Sandusky
Franklin "	.....	D. L. Moore	Columbus
Gallia "	.....	R. W. Holmes	Gallipolis
Green "	.....	R. H. Grube	Grape Grove
Guernsey "	.....	W. N. Bradford	Cambridge
Hamilton "	.....	Mark A. Brown	Cincinnati
Hamilton "	.....	S. P. Kramer	Cincinnati
Hamilton "	.....	Louis Schwab	Cincinnati
Hamilton "	.....	C. L. Bonifield	Cincinnati
Hardin "	.....	E. S. Protzman	Kenton
Highland "	.....	J. C. Larkin	Hillsboro
Hocking "	.....	A. K. Smith	Logan
Jefferson "	.....	W. H. Wood	Smithville
Knox "	.....	F. C. Larimore	Mt. Vernon
Lawrence "	.....	W. F. Marting	Ironton
Licking "	.....	C. P. King	Newark
Logan "	.....	C. E. Huston	Rushsylvania
Lorain "	.....	E. Cameron	Lorain
Madison "	.....	Andrew Rogers	West Jefferson
Miami "	.....	W. R. Thompson	Troy
Montgomery "	.....	Geo. B. Evans	Dayton
Montgomery "	.....	Geo. Goodhue	Dayton
Paulding "	.....	G. M. Brattain	Antwerp
Pike "	.....	C. W. Mooney	Waverly
Preble "	.....	D. W. McQueen	Camden
Putnam "	.....	C. E. Beardsley	Ottawa
Richland "	.....	J. S. Hedges	Mansfield
Scioto "	.....	Joseph S. Rardin	Portsmouth
Seneca "	.....	H. B. Gibbon	Tiffin
Shelby "	.....	J. W. Costolo	Sidney
Stark "	.....	T. C. Miller	Massillon
Summit "	.....	D. S. Bowman	Akron
Tuscarawas "	.....	J. E. Groves	Uhrichsville
Vinton "	.....	W. R. Moore	Swan
Williams "	.....	F. H. Pugh	Bryan

Under the head "Reports of Officers and Committees" reports were received as follows:

Committee on Scientific Work: The Secretary, as Chairman of this Committee, presented the program of the present meeting as the report of the Committee.

Report of the Committee on Publication: The Secretary, as Chairman of the Committee, reported that the transactions of 1903 had been printed and distributed among the members of the Association.

Reports of the Committee on Public Policy and Legislation:

T. C. Martin, Chairman of this Committee, submitted the following report:

"During the session of the last General Assembly the following bills, of interest to the medical profession, were presented:

First: Bill by Senator Heinlein providing for the establishment of a State Hospital for Tuberculosis.

Passed, and is now a law.

Second: Bill introduced by Representative Rawson of Cuyahoga County providing for the regulation of the sale of ice by Boards of Health.

Passed the House, but died in Committee in the Senate.

Third: A bill by Senator Pollock making provisions for the registration of vital statistics of the State of Ohio.

Failed to pass the Senate.

Fourth: A bill by Dr Crawford of the House of Representatives providing for the printing of formulas of patent medicines on each bottle.

Failed to pass the House.

Fifth: A bill by Representative Rawson of Cuyahoga County providing for reciprocity in medical licensure.

Passed the House, but died in the Committee in the Senate.

Sixth: A bill by Representative Bronson of Franklin County providing for the exemption of the senior class of 1904 from examination by the State Board of Medical Registration and Examination.

Failed to pass the House.

Seventh: A bill by Representative Smith of Hamilton County providing for the reduction of the examination fee of the Medical Board to five dollars ($5.00) and for the re-registration of all physicians of the State each year at three dollars ($3.00) each.

Died in the Medical Jurisprudence Committee of the House."

To illustrate what can be done by the medical profession in the way of legislation if they put forth the proper effort, Dr Martin spoke in detail of the Bill introduced to exempt the senior class of 1904 from the State Board examination. He said our Official Secretary discovered that the Bill had been presented and requested that the medical profession, which consisted of about 9,000 voters, should be given a hearing. This was granted. He also said that the students were very well represented at this hearing, having their attorney there to persuade the Committee to favor their Bill, and that a canvass of the House showed that 75 of the members were pledged to vote for the Students' Bill, and that the medical profession felt that there was very little prospect of defeating the Bill. However the Secretary sent out telegrams throughout the State requesting that the Representatives from the different districts be telegraphed that the medical profession desired this Bill to be defeated, and on the next morning telegrams arrived in large numbers, and when the Bill was submitted it was defeated by a vote of 60 to 38.

J. S. Rardin moved that the report be accepted and the Committee commended for its good work. This motion was seconded and carried.

Report of Committee on the State Pathological Institute called for, but no member of this Committee was present.

Report of Committee on Amendments to the Constitution and By-Laws.

J. C. M. Floyd reported the following recommendations:

"Recommend that Art. 8, Sec. 3, Page 2, of the Constitution be amended that 'the Officers of this Association shall be elected by the House of Delegates on the afternoon of the second day of the Annual Session.'

"Recommend that Chap. 5, Sec. 3, Page 8, of the By-Laws be amended that 'the report of the Nominating Committee and the election of Officers shall be the first order of business of the House of Delegates after the reading of the minutes at the afternoon meeting of the second day of the meeting of the Annual Session.'"

T. C. Martin moved that the report be received and adopted.

Drs Stephenson, Schwab, Miller and Moorehouse had some discussion as to whether the report was to be adopted, or accepted.

T. C. Martin changed his motion to read that the report be accepted and it was duly seconded and carried.

On motion of J. C. M. Floyd the amendment of Chap. 5, Sec. 3, Page 8 of the By-Laws was adopted.

Report of Councilors.

Verbal reports from Councilors concerning the present conditions of Medical Societies in their respective district were made by:

Brooks F. Beebe	First District.
Horace Bonner	Second District.
F. D. Bain	Third District.
J. H. Jacobson	Fourth District.
T. C. Martin	Fifth District.
J. C. M. Floyd	Seventh District.
J. E. Sylvester	Ninth District.
T. W. Rankin	Tenth District.

Louis Schwab offered the following resolution:

"*Resolved:* That a vote of confidence and thanks be and is hereby extended to the Councilors for their unselfish devotion to the work of this Association."

The above resolution was passed by a unanimous vote.

F. D. Bain made motion to adjourn. Carried.

Thursday Afternoon, May 19, 1904

Meeting called to order at 1:45 p. m. by the President.

Minutes of meeting of Wednesday evening were read by the Secretary and there being no objections the President ordered them recorded as read.

The next order of business "Report of Nominating Committee and Election of Officers" was then taken up,

but the President ruled that according to the Constitution this would have to be postponed until the meeting on the last day of the Annual Session.

Under this head there were several discussions entered into and several motions made, which were as follows:

C. E. Beardsley moved that the House proceed to elect officers for the ensuing year at this present meeting.

G. W. Moorehouse rose to a point of order, but withdrew his objection so that the motion of C. E. Beardsley could be acted upon.

Y. Stephenson, J. S. Rardin, F. D. Bain, J. C. M. Floyd and Louis Schwab then entered into discussion on the matter, Dr Bain calling attention to Section 3, Art. 5 of the By-Laws, and Dr Floyd calling attention to Section 3, Art. 8 of the Constitution.

H. G. Sherman, as Chairman of the Nomination Committee, asked that he be allowed to make a partial report for the Committee, if Dr Beardsley would withdraw his motion.

Dr Beardsley withdrew his motion.

S. P. Kramer, of Cincinnati, then moved that the amendment to the Constitution be adopted to permit the election of officers on the second day. This motion was sconded.

Y. Stephenson, T. C. Miller, M. Rosenwasser, G. W. Moorehouse and Horace Bonner discussed the matter at some length.

The President ruled that the motion before the House was out of order.

S. P. Kramer moved an appeal from the decision of the Chair. This motion was seconded, but the vote sustained the decision of the Chair.

Selection of Place of Meeting was then taken up and under this head, C. L. Bonifield moved that the next Annual Meeting be held in Columbus, Ohio. Seconded and carried.

Under the head of Miscellaneous Business, J. C. M. Floyd presented the following amendment to By-Laws:

Chapter 12, Sec. 13, Page 15. Insert after period in sixth line: "He shall send ten copies of the program of each County Meeting to his District Councilor, and one copy to the State Secretary."

This was laid over until the Friday meeting.

Dr Moorehouse moved "that all proposed amendments suggested at the session of the present meeting of the Association be referred to the Special Committee on Amendments for report tomorrow, and further that Drs Floyd, Larimore and Beck be continued as a Special Committee on Amendments until the next Annual Session, or until their successors are elected."

Seconded and carried.

R. H. Grube offered the following resolution, to be referred to the Legislative Committee:

"Whereas: The statute of this State intended to prevent criminal abortion is practically a dead letter because of judicial decisions;

Resolved: That steps be taken by this Association to secure remedial legislation."

F. D. Bain moved that resolution be referred to the Committee on Legislation. Seconded and carried.

T. C. Martin then presented report of the Joint Committee on Publication of Transactions, consisting of the Council and Publication Committee, as follows:

"We hereby recommend:

First; The abandonment of the present method of publishing the transactions.

Second; The establishment of an official organ, owned and managed exclusively by the Association.

Third; That the Publication Committee arrange the details for this project.

Fourth; That the Publication Committee report to the Council, which shall be authorized to act for the Association."

Horace Bonifield moved that the report be adopted as read.

Y. Stephenson seconded this motion.

The presentation of the above report gave rise to a very lengthy discussion, and many complications arose.

J. W. Costolo and R. T. Trimble spoke upon the matter.

S. P. Kramer moved an amendment that the recommendations be taken up *seriatim.* This motion was seconded.

Chas. Graefe moved that an amendment be made to reverse the order in which these recommendations be taken up. Seconded.

Chas. L. Bonifield, H. B. Gibbon and Horace Bonner discussed the last amendment.

H. B. Gibbon moved that the matter be laid on the table. Seconded.

A rising vote was taken on the motion to lay the matter on the table and resulted in 23 for, and 31 against. The President declared the motion lost.

Dr Graefe's amendment was then voted on and lost.

Dr Kramer's amendment that the recommendations be taken up *seriatim* was then voted and carried.

Louis Schwab asked for a report from the Financial Committee showing how much it would cost for the publication of these reports.

In answer to the above request T. C. Martin said that the cost of publication and distribution of the transactions during the past year was about $1150.00, or about $100.00 per month. Also that investigations of the Council showed that the cost of publishing the transactions in an official journal issued monthly would not exceed $100.00 per month.

Following this was discussion by Drs Costolo, Kramer, Bonifield, Moorehouse, Bonner and Martin.

T. C. Miller moved "as a substitute for all that is before the House that the Secretary send this down to the County Societies, in order that their delegates to the next Annual Session might be instructed in the matter." Seconded.

Motion made for a roll call of delegates on the vote on the last motion. Seconded and carried.

Vote resulted as follows:

Votes cast, 62; 29 in favor and 33 against.

The President declared the motion lost.

Dr Kramer moved the previous question. Seconded, carried.

The question of adopting the first recommendation was then taken up.

F. D. Bain moved a roll call on vote on this question. Seconded and carried.

C. M. Harpster moved that the House go into Executive Session. Seconded and carried.

Motion made to adjourn. Seconded. Motion lost.

Vote on first recommendation resulted as follows: 61 votes cast. 35 in favor of, and 26 against. The President therefore declared the recommendation adopted.

F. D. Bain moved that the meeting adjourn until 8:00 a. m., Friday. Seconded. Lost.

Louis Schwab moved that the vote be reconsidered. Seconded.

G. W. Moorehouse moved that the meeting adjourn until 9:00 a. m., Friday. Seconded. Lost.

T. C. Martin moved that the second recommendation of the Joint Committee be taken up and considered. Seconded.

At this point the President placed F. D. Bain in the chair as he desired to attend the general meeting and receive Dr G. Frank Lydston, who was now awaiting him.

With Dr Bain in the chair the discussion was continued by Drs Trimble, Rankin, Costolo, Spratt, Stephens and Beebe.

Vote on the question to reconsider the adoption of the first recommendation was taken and resulted in motion being carried.

Dr Schwab asked that the resolution of Dr Reed, of Cincinnati, be read.

His request was granted and the Secretary read the resolution.

R. T. Trimble moved that the matter of changing the plan of publication of the transactions be postponed until the next Annual Meeting and referred back to the County Societies for consideration and instruction of their delegates. Seconded.

The Chair ruled the motion out of order. Dr Trimble appealed from the decision of the Chair. The appeal was sustained, and Dr Trimble's motion was voted on and carried.

S. P. Kramer moved that the meeting adjourn until 9:00 a. m., Friday. Seconded. Carried.

Friday Morning, May 20, 1904

Meeting called to order by the President. Minutes of previous meeting read and approved.

The following report was submitted by J. A. Duncan, Treasurer:

Receipts:—		
Balance on hand	$ 38.49	
Dues	2,311.75	
Total		$ 2,350.24

DISBURSEMENTS.

P. M. Foshay, Secretary and Editor:		
Salary Secretary 1902	$ 125.00	
Salary Editor	100.00	
Furniture	49.99	
Postage and Expenses	119.98	
Total		$ 394.97
J. A. Duncan, Treasurer:		
Salary 1902	$ 125.00	
Expense, Dayton Meeting	15.00	
Expense, Postage	4.00	
Expense, Rubber Stamps	.65	
Expense, Surety Bond	7.50	
Total		$ 152.15

Councilors:		
J. E. Sylvester	$ 25.60	
J. C. M. Floyd	34.26	
H. H. Jacobs	12.50	
J. H. Jacobson	18.25	
T. W. Rankin	10.90	
T. C. Martin	17.75	
F. D. Bain	10.45	
B. F. Beebe	99.93	
Total		$ 229.64
Stephen E. Cone, Stenographer		$ 50.00
Miscellaneous		348.50
J. B. Savage & Co., Publishers		960.25
Expense Printing Annual Transactions	$ 872.00	
Printing	88.25	
National Advertising Co., Printing	3.50	
American Med. Association, Charters, Con., etc.	4.75	
Chaplin Printing Co., Printing	44.00	
A. J. Brown, Certificates	2.60	
Cleveland Medical Journal, Postage	27.50	
Postage for Annual Transactions	231.00	
Western Union Telegraph Co., Telegrams	.75	
Freight and Drayage	10.65	
A. E. Westfall, Incorporation Papers	7.00	
American Exp. Co., Exp. Charges	1.75	
Central Traffic Association	11.00	
Dues Returned	4.00	
Total		$ 2,135.51
Cash Balance Account		214.73
Total		$ 2,350.24

Respectfully submitted,

JAMES A. DUNCAN.

Y. Stephenson moved that the Treasurer's report be adopted.

Motion seconded by J. S. Rardin. Carried.

James A. Duncan, seconded by Chas. L. Bonifield, moved that the Secretary's salary for the past year be divided between Drs Winders and Foshay; Dr Winders to receive $100.00, and Dr Foshay to receive $25.00. Motion carried.

Itemized bills for expenses of Councilors and for stenographer services were presented and on motion of S. P. Kramer, seconded by Chas. L. Bonifield, were approved and ordered paid.

R. T. Trimble moved that a Committee of three be appointed to enquire into the failure to secure the usual railroad rates, owing to the fact that less than 100 certificates for such rates were presented.

Motion seconded and carried.

The President appointed G. W. Moorehouse and W. E. Bruner.

G. W. Moorehouse moved that the Council be made a Committee to audit the Treasurer's report.

Louis Schwab moved to amend by substituting a Committee of three members of the House of Delegates.

The amendment was accepted by Dr Moorehouse. Seconded and carried.

The President appointed Thos. Hubbard, J. G. Keller and Chas. Graefe on this Committee.

The Committee on Nominations presented the following ticket:

For President—S. S. Halderman, Portsmouth; W. C. Jacobs, Akron; Benj. McClellan, Xenia.

For Vicepresident—J. A. Dickson, Ashtabula; J. S. Deamy, Bellefontaine; W. E. Morris, Lisbon, and A. H. McCullough, Mansfield.

For Secretary—Frank Winders, Columbus. For Councilor, First District, Brooks F. Beebe, Cincinnati. Sixth District, T. Clark Miller, Massillon. For Delegates to the American Medical Association, John P. Sawyer, Cleveland; J. F. Marchand, Canton; Thos. Hubbard, Toledo.

Y. Stephenson moved that the report of the Committee on Nominations be accepted.

Motion seconded by C. L. Bonifield and carried.

T. C. Martin, seconded by C. L. Bonifield, moved that the name receiving the smallest number of votes on each ballot be dropped.

J. E. Groves moved to amend, by adding the words, "After second ballot."

The amendment was accepted by Dr Martin, and the motion carried.

The President appointed George Goodhue and H. B. Gibbon to act as tellers.

The first ballot for President resulted in the election of S. S. Halderman, of Portsmouth.

S. P. Kramer, seconded by R. H. Grube, moved that the rules be suspended and the Secretary be instructed to cast the vote of the House of Delegates for J. A. Dickson, J. S. Deamy, W. E. Morris and H. H. McCullough for Vicepresidents. Motion carried.

Y. Stephenson moved that the rules be suspended, and that Geo. Goodhue be instructed to cast the vote of the House of Delegates for Frank Winders for Secretary.

The motion was seconded by Louis Schwab and carried.

C. L. Bonifield moved that the rules be suspended and that the Secretary be instructed to cast the vote of the House of Delegates for Brooks F. Beebe for Councilor for the First District.

For Councilor for the Sixth District, the name of T. Clark Miller was presented by the Committee on Nominations, and the name of H. H. Jacobs was presented by W. E. Bruner.

The nomination of Dr Jacobs was seconded by T. Clark Miller.

The first ballot resulted in the election of T. Clark Miller.

On motion of G. W. Moorehouse, the rules were suspended and the Secretary was instructed to cast the vote of the House of Delegates for Thomas Hubbard, J. F. Marchand and John P. Sawyer, for Delegates to the American Medical Association.

Motion seconded and carried.

J. C. M. Floyd for the Committee on Amendments recommended the adoption of the following:

Chap. 12, Sec. 13, of the By-Laws, insert after period in sixth line: "He shall send ten copies of the program of each county meeting to his District Councilor, and one copy to the State Secretary."

Louis Schwab moved that the amendment be adopted.

Motion seconded by R. H. Grube and carried.

The Committee further recommended the adoption of the following amendments to Chap. 8, Sec. 1, of the By-Laws:

"Following, 'A Committee on Nominations,' insert the words: 'A member of the National Legislative Council.'

Same Chapter, Sec. 8. The member of the National Legislative Council shall represent the Association at the Annual Conference of the National Legislative Council of the American Medical Association, and shall discharge such duties as may be prescribed by the Constitution and By-Laws of the American Medical Association."

T. C. Martin, seconded by R. H. Grube, moved the adoption of these amendments. Motion was carried.

The Committee further reported and recommended that the House of Delegates refuse to adopt amendments to Chap. 4, Sec. 2, of the By-Laws.

T. Clark Miller spoke in favor of the adoption of these amendments and moved their adoption.

The motion was seconded, but was lost.

The Committee reported against the adoption of amendments to Chap. 12, Sec. 12, of the By-Laws.

T. Clark Miller moved to adopt these amendments.

Motion was seconded and lost.

H. G. Sherman presented the following resolution:

"*Whereas:* The value of perfect sight and hearing is not fully appreciated by educators, and neglect of the delicate organs of vision and hearing often leads to disease of these structures, therefore, be it

Resolved: That it is the sense of the Ohio State Medical Association that measures be taken by boards of health, boards of education and school authorities, and, where

possible, legislation be secured, looking to the examination of the eyes and ears of all school children, that disease in its incipiency may be discovered and corrected."

H. G. Sherman moved the adoption of these resolutions, and that a committee of three be appointed by the President to investigate the matter referred to in the resolutions.

The motion was seconded and carried.

The President appointed the following committee: H. G. Sherman, Cleveland; C. F. Clark, Columbus; and S. P. Kramer, Cincinnati.

T. C. Martin presented the following resolution:

"Whereas: The publication, known as the *Ladies' Home Journal,* did in its April issue expose to its readers the names of certain proprietary medicines which contain alcohol and other harmful drugs, specified the proportions of the same and urged the recognition of their injurious character, and

Whereas, The *Ladies' Home Journal* in this matter served the good of humanity disinterestedly, and not without some risk of loss to itself, be it

Resolved: By the Ohio State Medical Association, that we hereby commend the said *Journal* for its purity of purpose, signal courage and its incomparable noncommercialism."

Dr Martin moved that the Secretary be instructed to send a copy of the above resolution to the *Ladies' Home Journal.*

Motion seconded and carried.

The following resolution was presented by W. F. Marting:

"Resolved: That the Secretary of the Association is hereby instructed to have an authenticated copy of the Constitution and By-Laws and the official record of the House of Delegates printed in pamphlet form, with index in same, as soon as possible, and in sufficient numbers to supply the county societies, and the needs of the next annual session of the Association."

Dr Marting moved the adoption of this resolution.

The motion was seconded by T. Clark Miller and adopted.

A. P. Ohlmacher presented the following report of the Committee on State Pathological Institute:

"The work of the committee never assumed the scope contemplated; in fact, it did not get beyond the preliminary stages, as it was discovered that the prospects of obtaining favorable legislation were practically hopeless and that it was an inauspicious time to bring the project to the attention of the General Assembly.

An informal meeting was held July 28, 1903, in Dr Wilson's office with President Thompson of the Ohio State University, who expressed his approval of the project of a central research laboratory for the State hospitals, and his willingness to aid in securing favorable cooperation on the part of the State University.

A regular meeting of the committee, attended by all its members except Dr Jacobson, was held in Columbus, September 28, 1903. Reports from the projectors of the Pathological Institute of the New York State Hospitals and of the Psychiatric Ward of the University of Michigan were presented, together with documents indicating the methods by which these institutions were obtained through the State legislatures. The committee planned to begin the distribution of literature to the county societies but was unable to carry this out through lack of available funds for clerical service.

Your committee has lost none of its enthusiasm as to the worthiness of the object which it had in view, and it believes that its failure to accomplish definite results should not lead to the abandonment or discouragement of the movement for its object, the establishment of a central research and teaching laboratory of the State medical institutions. It would urge the continuance of the agitation in favor of the project with the object of bringing it to the attention of the next and possibly more favorable General Assembly.

Signed, E. J. WILSON, Columbus
A. P. OHLMACHER, Gallipolis
F. W. LANGDON, Cincinnati
JULIUS JACOBSON, Toledo
A. B. HOWARD, Cleveland

S. P. Kramer, seconded by T. H. Pugh, moved the adoption of this report. Motion carried.

T. C. Martin presented the following resolutions:

"Whereas: The President of the United States has appointed a commission of seven, known as the Canal Commission, to undertake the construction of a canal across the Isthmus of Panama, and

Whereas: The proposed work for its successful performance demands the most perfect sanitary supervision, and

Whereas: The personnel of this commission does not comprise a member who by training in medical matters is competent,

Be it resolved, That this Association hereby instructs its Legislative Committee to employ every means to secure from the Congress of the United States such action as will provide for an increase in the membership of the Canal Commission to nine members, and further

Be it resolved, That we recommend that these members shall be physicians whose training and experience prepares them to cope successfully with the problems involved."

Dr Martin moved the adoption of the above resolution.

The motion was seconded and carried.

Brooks F. Beebe moved that each Councilor be and is hereby directed to hold district meetings in his district in accordance with Article 6 of the Constitution; such meetings to be held about midway between the dates of the yearly meeting of this Association.

Motion seconded by J. C. M. Floyd, and carried.

R. W. Holmes presented the following resolution:

"Resolved: That the Ohio State Medical Association hereby expresses its approval and endorsement of the object and work of the Association of Assistant Physicians of the Ohio State Hospitals."

S. P. Kramer moved to adopt the above resolution.

Motion seconded by Louis Schwab and carried.

T. C. Martin, seconded by J. C. M. Floyd, moved that the President appoint a committee to select and provide a seal for the Association.

The motion was carried, and the President appointed T. C. Martin and F. E. Bunts as members of this committee.

J. C. Larkin moved that the annual banquet be held on the evening of the last day of the meeting at future meetings.

Motion seconded by B. F. Beebe and lost.

G. W. Moorehouse moved to adjourn.

Motion seconded and carried.

GENERAL MEETING

Wednesday afternoon, May 18, 1904. Meeting called to order at 1:30 p. m. President Chas. S. Hamilton in the chair.

The report of the Committee of Arrangements was presented by W. E. Bruner.

S. S. Halderman moved that a vote of thanks be tendered to the Committee of Arrangements and to the Academy of Medicine of Cleveland for the excellent arrangements made for this meeting.

The motion was seconded by J. H. Jacobson and unanimously carried.

The President called Vicepresident W. W. Pennell to the chair.

The address of the President was then delivered.

F. D. Bain moved that a committee of three be appointed by the chair to take into consideration the recommendations made in the address of the President.

The chair appointed Drs Sylvester, Bonner and Walker.

President Hamilton then resumed the chair.

Paper: "Report of Cases of Syphilis of the Stomach," by C. F. Hoover, Cleveland.

Paper: "Treatment of Appendicitis with Suppuration Diffused Among the Intestines and Not Limited by Adhesions," by Dudley P. Allen, Cleveland. This paper was discussed by Drs Chas. Graefe, Sandusky; J. H. Jacobson, Toledo; M. Stamm, Fremont; W. H. Humiston, Cleveland;

S. S. Halderman, Portsmouth; F. C. Larimore, Mt. Vernon; W. E. Lower, Cleveland; and the discussion was closed by the author.

Paper: "Observations by a General Practitioner," by H. B. Gibbon, Tiffin.

Paper: "Abscess of the Temporospenoidal Lobe," by Thomas Hubbard, Toledo. This paper was discussed by Drs J. A. Thompson, Cincinnati; A. R. Baker, Cleveland; D. N. Kinsman, Columbus; Dudley P. Allen, Cleveland; Oliver Tydings, Piqua; and the discussion was closed by the author.

Paper: "Open Air Treatment of Tuberculosis in Northern Ohio," by John P. Sawyer, Cleveland. This paper was discussed by Drs D. N. Kinsman, Columbus; J. H. Lowman, Cleveland; S. S. Halderman, Portsmouth; J. M. Waugh, Cleveland; and the discussion was closed by Dr Sawyer.

Paper: "Some Observations on Climatic Changes in Respiratory Diseases," by T. N. B. Whiteleather, Malvern. This paper was discussed by Drs John P. Sawyer, Cleveland; H. C. Bliss, Cleveland; and the discussion was closed by the author.

Paper: "Fifty Years in Medicine," by John D. West, Hopedale.

Paper: "Diabetes Mellitus with Especial Reference to Etiology," by Geo. F. Zinninger, Canton.

Adjourned at 6:00 p. m.

Thursday, May 19, 1904. Called to order at 3:20 p. m. President Hamilton in the chair.

The Oration in Surgery upon the subject of "The Surgery of the Prostate," was delivered by G. Frank Lydston, of Chicago, Ill.

A vote of thanks was tendered to Dr Lydston for his excellent address.

Paper: "Studies on the Etiology of Variola," by Wilbur Travis Howard and Roger S. Perkins, Cleveland. The paper was read by Dr Howard.

Paper: "Carcinomatous Transformation of Ulcer of the Stomach," by John Dudley Dunham, Columbus. This paper was discussed by Drs J. H. J. Upham, Columbus; N. R. Coleman, Columbus; and the discussion was closed by Dr Dunham.

Paper: "Gastrectasia, Its Clinical Significance and Treatment," by D. B. Conklin, Dayton.

Paper: "Modern Medicine," by D. W. McQueen, Camden.

Adjourned at 5:45 p. m.

MEDICAL SECTION

Thursday, May 19, 1904. Called to order at 9:00 a. m. Vicepresident B. R. McClellan in the chair.

Paper: "Some Unusual Manifestations of Influenza," by Chas. H. Higgins, Sonora. This paper was discussed by Drs D. W. Shumacher, New Bedford; R. H. Grube, Grape Grove; J. H. Lowe, Piqua; and the discussion was closed by the author.

Paper: "Migraine," by D. N. Kinsman, Columbus. This paper was discussed by Drs A. R. Baker, Cleveland; J. W. Costolo, Sidney; John A. Thompson, Cincinnati; A. A. Starner, Galion; T. N. B. Whiteleather, Malvern; G. H. Colville, Circleville; Young Stephenson, Georgetown; F. K. Smith, Warren; W. R. Hosick, New Comerstown; Oliver Tydings, Piqua; and the discussion was closed by the author.

Paper: "The Plea of Insanity," by R. H. Grube, Grape Grove.

Papers: "Dilatation of the Heart," by D. C. Houser, Millerstown, and "Idiopathic Cardiac Dilatation," by Geo. A. Fackler, Cincinnati. These papers were discussed by Drs J. H. Lowman, Cleveland; D. S. Hanson, Cleveland; and Geo. A. Fackler, Cincinnati.

Friday, May 20, 1904, 9:00 a. m. Dr N. R. Coleman in the chair.

Paper: "A Neglected Factor in a Medical Problem," by D. R. Silver, Sidney. This paper was discussed by Oliver Tydings, Piqua.

Paper: "Habit," by C. D. Mills, Marysville. This paper was discussed by Drs E. W. Shumacher, New Bedford; C. J. Lewis, Chicago, Ill.; G. H. Colville, Circleville; L. G. Leland, Newton Falls; and the discussion was closed by the author.

Paper: "Some Therapeutic Needs," by John A. Larkin, Hillsboro. This paper was discussed by C. D. Mills, Marysville.

Paper: "Neglected Little Things," by R. S. Reid, Bucyrus.

Paper: "Mental Depression," by Chas. S. McDougall, Athens.

Adjourned at 12:00 m.

SURGICAL SECTION

Thursday morning, May 19, 1904. Vicepresident W. W. Pennell in the chair.

Paper: "Some Practical Deductions from Personal Experiences with Ectopic Gestation," by R. E. Skeel, Cleveland. The paper was discussed by Drs C. E. Beardsley, Ottawa; W. H. Humiston, Cleveland; R. B. Hall, Cincinnati; F. F. Lawrence, Columbus; J. F. Fox, Toledo; Lester Keller, Ironton; and R. E. Skeel closed the discussion.

Paper: "Contracture of the Neck of the Bladder," by Thomas Grant Youmans, Columbus.

Paper: "Hernia of Meckel's Diverticulum, with Report of Case of Strangulated Inguinal Hernia of Same," by Frank E. Bunts, Cleveland.

Paper: "Traumatic Ostitis of the Ulna and Treatment by Operation," by Joseph Robertson, Steubenville.

Paper: "Conservatism in Pelvic Surgery," by Hunter Robb, Cleveland.

Paper: "Retroversion," by J. C. Tritch, Findlay.

Paper: "A Resumé of Clinical Results of Operation on the Kidneys with a Report on the Newer Methods of Diagnosis," by Geo. W. Crile and Wm. E. Lower. This paper was discussed by Drs Geo. Goodhue, Dayton; H. J. Whitacre, Cincinnati; C. M. Harpster, Toledo; J. F. Baldwin, Columbus; and the discussion was closed by Dr Lower.

Paper: "Some Considerations of Empyema," by Mark Millikin, Hamilton. Discussed by H. J. Whitacre, and the discussion closed by the author.

Adjourned at 12:30 p. m.

Friday morning, May 20, 1904. Vicepresident B. R. McClellan in the chair.

Paper: "Diagnosis and Treatment of Hernia," by Jesse McClain, Coshocton. Discussed by Drs Lester Keller, Ironton; S. S. Thorn, Toledo; and W. J. Means, Columbus.

Paper: "Contusions of the Abdomen," by C. A. Hamann, Cleveland. This paper was discussed by Drs W. E. Lower, Cleveland; and A. F. House, Cleveland. The discussion was closed by the author.

Paper: "Three Recent Cases of Croup, Due to Staphylococcus and Requiring Tracheotomy," by F. P. Anzinger, Springfield. The paper was discussed by Dr J. J. Thomas, Cleveland. The discussion was closed by Dr Anzinger.

Paper: "Pancreatitis," by Wm. J. Gillette, Toledo.

Paper: "Acute Hemorrhagic Pancreatitis, with Report of Case," by J. H. J. Upham and Isabel Bradley, Columbus.

The papers of Drs Gillette and Upham were discussed by Drs A. F. House, Cleveland; H. J. Whitacre, Cincinnati; and the discussion was closed by Dr Upham.

Paper: "Pregnancy Complicated by Fibroid Tumors," by Charles L. Bonifield, Cincinnati.

Paper: "Cocain Anesthesia in General Surgery," by W. J. Means, Columbus. This paper was discussed by Drs J. G.

Spenzer, Cleveland; W. E. Lower, Cleveland; Morris Coplan, Cleveland; F. C. Herrick, Cleveland; H. J. Whitacre, Cincinnati; E. E. Brown, Cleveland; Park L. Myers, Toledo; and the discussion was closed by Dr Means.

Paper: "The Relation Between Typhoid Fever and Appendicitis," by N. Stone Scott, Cleveland. Discussed by Drs William J. Gillette, Toledo, and the discussion was closed by the author.

Paper: "Sacral Teratoma with the Report of an Interesting Case," by Lester Keller, Ironton.

Paper: "The Need of More Careful Work in Obstetrics," by Fred Warfield Lane, Cambridge.

Paper: "Radium and Radioactivity," by Myron Metzenbaum, Cleveland.

Adjourned at 12:45 p. m.

CHAPTER II—ADDRESSES

The Surgery of the Prostate

By G. Frank Lydston, M. D., Chicago, Ill.

Professor of Genitourinary Surgery and Syphilology, Medical Department University of Illinois; Attending Surgeon, St. Mary's and Samaritan Hospitals, etc.

While deeply appreciating the honor you have done me in inviting me to address you, I nevertheless realize fully the difficulty of fulfilling my obligation. Western medicine and surgery is so thoroughly *en rapport* with scientific advancement that it is not easy to say anything with which the members of so progressive an Association as yours are not already more or less familiar. The fact that you have in your ranks men who have distinguished themselves in regional surgery is an additional handicap. I have, however, taken the liberty of selecting a subject which is decidedly a live one at the present time, and in which I have for many years taken special interest, and have done considerable work.

The time has arrived when one may approach the subject of prostatic disease with full confidence that his professional auditors are ready to accept the surgery of the prostate as a legitimate branch of surgical endeavor. The prostate is no longer a *noli me tangere*. Its diseases are no longer regarded with hopeless pessimism. The technic of prostatic operations has not yet been so thoroughly perfected that we have no more worlds to conquer, but it has most assuredly been so far developed that it will bear favorable comparison with other fields of operative work.

One of the most important subjects in the entire range of genitourinary disease is the various inflammatory affections of the prostate in their relations to the surgery of the organ. No discussion of the management of prostatic disease is complete without their consideration. When the far-reaching effects of gonococcal infection of the urethral adnexa in the male were discovered, the surgery of the genitourinary organs advanced with a tremendous stride. The growing belief that inflammations of various kinds occurring in eary life bear an etiologic relation to prostatic obstruction occurring later on lays especial emphasis upon the importance of the subject of prostatic infections. The frequency with which the prostate becomes involved in gonorrhea is not fully realized even now, especially by those who lay particular stress on posterior urethral infection. It has been said that fully 80% of gonorrheics are affected sooner or later by posterior urethral infection. This I believe to be an exaggeration; still it is very difficult to formulate statistics upon this point, for the reason that the genitourinary surgeon who gets the protracted, complicated and chronic cases rarely has the opportunity of comparing statistic notes with the general practitioner and dermatologist, into whose hands a large proportion of the acute cases, and especially those of the simpler type, naturally fall.

I have laid down as a broad, general proposition the following: *viz.*, that acute or subacute gonorrheal inflammation of the posterior urethra is essentially prostatitis. I do not believe it possible for a virulent inflammation of the posterior urethra to occur without infection of the prostatic glandular tissue in greater or less degree. The affinity of the gonorrheal microorganism for glandular structures is so well known and so justly admitted that it is surprising to me that there can still be found authorities who believe that virulent gonorrhea may attack the posterior urethra and limit itself to that part. A knowledge of the special susceptibility of secreting glandular tissue to gonococcal infection, associated with a knowledge of the anatomy and physiology

of the prostate, should, it seems, to me, be all-sufficient to substantiate the position I have taken, namely, that posterior urethritis is in by far the majority of cases, and in all acute cases, prostatitis of greater or less degree of severity and extent of involvement.

Considering the number and size of the openings of the prostatic ducts upon either side of the *veru montanum,* and the close relation of the ejaculatory ducts to the area involved in posterior urethritis, it would seem impossible, in the presence of an infection of even slight degree of virulency, that involvement of these various secretory outlets upon the floor of the prostate, with subsequent extension to the prostatic glandular tissue proper, and perhaps to the testicle, should not occur. The aspirating effect of the contraction and relaxation of the involuntary muscular fiber of the prostate and of the muscular perineal structures surrounding the organ involved in the physiologic expulsion of fluid at various times is an additional factor which favors infection. In this expulsive act secretions are drawn from the anterior urethra into the prostatic urethra, and, if infection of the latter region exists, involvement of the posterior urethra—and very soon thereafter, if not immediately, prostatic infection—is well-nigh inevitable. This explains why sexual indiscretion, in the presence of acute or subacute gonorrhea, is followed so often and so speedily by prostatic, vesical or testicular complications.

At this juncture I wish to emphasize the fact that by the time the deep urethra and prostate are involved, gonorrhea is a mixed infection. This explains the special danger of suppuration of the prostate and its environs that occurs in deep-seated gonorrhea. The frequency with which suppuration of greater or less extent occurs in the prostate is not realized by the profession at large, nor, I believe, even by many authorities upon genitourinary surgery. The recurrent discharge that occurs coincidentally with the subsidence of symptoms in acute prostatic inflammation I have long accepted as meaning in a large majority of cases the evacua-

tion of a small abscess, which, perhaps, no means of exploration would have served to discover. I have no doubt that there are many present who have noted cases of acute prostatic inflammation, perhaps with retention, in which no symptoms of abscess, either objective or subjective, existed, and in which pain, temperature, frequency of micturition and strangury have disappeared suddenly, coincidentally with recurrence of urethral discharge. The popular tradition that the reappearance of the discharge is beneficial in such cases and an indication of the subsidence of the prostatic inflammation, is as old as the hills. The explanation which I have offered is, however, not generally advanced. The importance of watching the progress of acute prostatitis very carefully to forestall the possible accumulation of a quantity of pus sufficient to endanger the life of the patient cannot be overestimated. I am satisfied that many cases of prostatic suppuration, in both acute and chronic disease of the organ, have been allowed to die without relief, simply because the practitioner was not alive to the suppurative possibilities of prostatic disease. The difference between the case of extensive prostatic suppuration that survives, and the one that dies, lies oftener than not in the fact that in one class of cases the abscess ruptures spontaneously, and in the other it does not, rather than in the skill of the physician in charge of the case which recovers.

In the course of 25 years' experience I have met with a large number of cases of old men with acute retention who, as a consequence of catheter traumatism and infection, developed prostatic abscess. In some cases the abscess was detected. More often it was not discovered, or its existence even suspected until spontaneous rupture occurred, or the patient died without rupture, the postmortem alone revealing the actual condition.

One of the most interesting cases that ever came under my observation was that of a young subject with acute gonorrhea, who died and was taken to the postmortem table with a diagnosis of typhoid fever. The autopsy disclosed not

enteric fever, but a huge prostatic and periprostatic abscess, which, beyond possibility of doubt, was the cause of death.

The smaller abscesses occurring in the prostate, in the course of acute gonorrheal infection, are often the most troublesome, because, while we may suspect their existence, we find no objective symptoms that seem to warrant a cutting operation. Indeed, even if we knew that the prostate contained a dram or so of pus, there is a question in my mind whether we would be justified in seeking for it unless its precise location were discovered, save in instances in which the local symptoms are so severe as to imperatively demand surgical intervention. This is rarely the case in the small abscesses, because by the liberal use of anodynes we can usually control the severity of the symptoms until such time as the abscess ruptures spontaneously, which, fortunately, it eventually does, as a rule, and in the direction of least resistance and greatest safety to the patient, namely, into the prostatic urethra.

Cases in which a collection of pus is discoverable should, of course, not be temporized with. Cases in which the constitutional symptoms are severe and almost pathognomonic of suppuration demand surgical intervention, but cases in which there is comparatively little swelling of the prostate, even if associated with severe strangury and frequency of micturition, with perhaps reflex pains in the cord and lumbar region and testes, should not be interfered with surgically, providing the constitutional symptoms are not marked. In the majority of such cases there will be a sudden recurrence of the urethral discharge, with an almost complete subsidence of the annoying symptoms. Fortunately for the patient, the tendency of even abscesses of considerable size is to burrow in the direction of the prostatic urethra, which, as I have said, is the direction of least resistance, save where the periprostatic tissue is involved. Here the direction of least resistance is always from the tough capsule of the prostate, not toward the urethra, but toward the rectum and pelvic cavity. It is such cases that are most likely to lead

to the death of the patient unless surgical intervention is resorted to. Cases of obstinate retention in prostatic inflammation are to be looked upon with suspicion, whether definite symptoms of suppuration be present or not. So far as my own experience goes, I have been led to conclude that in such cases the obstinacy of retention is usually explicable by the presence of a greater or less collection of pus. Should this collection of pus encroach upon the urethra, it need not be very large in order to produce complete retention.

With reference to the method of evacuation of pus from the prostate, I will state that I have long since ceased to operate from the rectal side of the abscess. In cases in which the collection of pus is not definitely outlined, or when operating upon suspicion, I prefer the inverted Y incision, so often used in prostatectomy, as affording the most room for the exploration of the organ.

I have often been surprised in operating upon prostatic abscesses of long duration by the rupture of the sac into the prostatic urethra, that under the mere pressure of my index finger, the operation is thus completed without any further cutting than a perineal section. I have found considerable collections of pus surrounding the prostatic urethra, the pus in several instances dissecting cleanly the urethral walls traversing the abscess cavity as a well-defined tube, although by digital exploration by the rectum I could not detect any point of fluctuation. Here I was compelled to operate upon suspicion, basing my opinion as to the necessity of surgical intervention upon the severity of the inflammation, the extent of the prostatic swelling, the obstinate retention, and constitutional symptoms—recurrent chills, fever and sweating. In cases of this kind it is rather unfortunate to have the abscess rupture under the exploring finger, for it makes perfect drainage of the cavity very difficult. It is better in such cases to cut through the prostatic capsule, and by blunt dissection evacuate the abscess from the prostatic rather than the urethral side.

A special point which I desire to mention in the sur-

gical consideration of the prostate is the question of the existence of prostatic obstruction independently of so-called hypertrophy and acute or chronic inflammation. I well remember the statement of the late Sir Henry Thompson, made many years ago, that there was not in all the museums of Europe a single specimen illustrating stricture of the prostate. It is obvious that if we exclude from consideration congestive, inflammatory, hyperplastic and hypertrophic obstructions of the prostatic urethra, due to diseases of various kinds, stricture of the prostatic portion of the canal must certainly be very rare. A neoplasm, or even pus, however, pressing upon the anterior urethra and occluding its lumen, produces what, for want of a better term perhaps, we term stricture. The same condition occurring in the prostate is not so designated. Admitting, for the sake of argument, the logic of this difference in nomenclature, I desire to call attention to the fact that congenital obstructions of the prostatic urethra are occasionally found. In dissecting at random a large number of prostates and bladders, I found four congenital strictures of the prostate. These consisted in several instances of flaps and bands of prostatic mucous membrane, reenforced by connective and prostatic muscular tissue. In two instances that I recall, a distinct fleshy band traversed the prostatic urethra obliquely from roof to floor. The band in each instance was composed of muscular tissue covered by mucous membrane, and resembled in a general way the columnæ carnæ of the heart.

I have met with no less than six instances of constriction of the prostatomembranous junction of a congenital character. In several instances the opening in the prostate was deflected markedly from the median line, being covered in laterally. The anatomic arrangement was such that the membranous urethra joined the prostatic urethra at what might be termed a slight angle.

I am satisfied that these congenital anatomic coarctations occur more frequently than is ordinarily supposed, and

explain a certain proportion of cases of difficult instrumentation. What relation, if any, they bear to the different forms of prostatic obstruction, I do not know.

Another condition occasionally found is fatty degeneration of the prostate. This occurs to a certain extent in normal senile prostates. It is more often met with in alcoholics. I have found it in several cases of retention in patients who died of acute alcoholism. Its surgical importance lies in the fact that it is always associated with fatty degeneration of the vesical wall. Even slight temporary retention under such circumstances gives rise to permanent atony. Instrumentation is dangerous, because the vesical walls are easily penetrated, and rupture may occur, as proved by one instance of a patient who died from acute alcoholism, with retention, and the bladder was found spontaneously ruptured. In this case there was no known traumatism, although I admit that traumatism was suspected. Should traumatism occur with a full bladder under the circumstances described, rupture would be almost inevitable.

Increasing experience in the field of prostatic surgery and pathology strengthens my belief that much of the old-time views were rubbish, especially with reference to the etiology of prostatic hypertrophy. The senile theory, as applied to prostatic disease in advanced life, has wrought incalculable harm both to surgery and to sufferers from prostatic obstruction. Even today, the principal obstacle in the way of application of modern surgical technic to diseases of the prostate is the fatuous notion that prostatic enlargement is incidental to advanced life, and in many instances inseparable from it. This fallacious idea, I regret to say, is not confined to the laity, but the rank and file of the profession is still imbued with it. The consequence is that when urinary symptoms develop at or beyond middle age, patients are likely to delude themselves with the idea that all old men are likely to be similarly troubled. So far from general adoption are the principles of modern surgery, as applied to the prostate, that the family physician

is still very likely to console the patient with the statement that his ailment is merely an incident of advancing years. I long ago claimed that the enlarged prostate is not a senile prostate. The normal prostate atrophies in old age. It is a sexual gland, and as its function falls into desuetude its circulatory and nutritive activity lessens, and a shrinkage of the gland finally results. I recall a recent demonstration of the operation of prostatectomy upon a cadaver which was not a brilliant success, because the subject, a man nearly 70 years of age, had absolutely no prostate upon which to demonstrate the operation. I took great pleasure in calling attention to the subject as the possessor of a true senile prostate.

The relation of senility to prostatic obstruction is simply this: The conditions which produce the disease are operative, or begin to operate some years before enlargement of the organ is manifest. The patient arrives at or considerably beyond middle life before the prostatic enlargement is sufficient to produce symptoms calling his attention to his condition. In many instances very advanced age is attained before symptoms develop. This is a matter of common observation.

In speaking of the relatively early period at which the conditions causative of prostatic hypertrophy develop, I will reiterate what I have previously said, that chronic congestion on the one hand, and infections of various kinds upon the other, play a very important rôle in the etiology of so-called senile hypertrophy of the prostate. Congestion leads to connective-tissue hyperplasia, and infection to glandular inflammation here as elsewhere. Secondarily, the adenomatous tumors formed as the result of glandular overgrowth, acting as foreign bodies, produce irritation and pressure congestion, which lead to proliferation of connective tissue. From this premise it is obvious that prostatic enlargement may present varying proportions of glandular and fibroconnective tissue, which proportions are determined largely by the age of the process. The important deduc-

tion which should be drawn from a knowledge of the early beginning of prostatic disease is that the urinary history of the male should be supervised more carefully than it is. In the majority of instances in patients of advanced years, the symptoms will be found upon inquiry to have extended over a period of many months, or perhaps many years, even in cases in which the patients state off-hand that their trouble has but recently begun. By a careful supervision of the urinary apparatus in the male, with a due appreciation of the early period of development of prostatic disease, the surgery of the organ may be greatly advanced. Cases will not be selected for operation because they are in such desperate condition that nothing else offers any hope of relief, but they will be turned over to the surgeon for operation early in the history of the prostatic obstruction, long before secondary infection and other complications have occurred, and at the period most favorable for operation. That the operation of prostatectomy is indicated in all cases in which increasing enlargement of the prostate is noted after middle life, whether symptoms have yet developed or not, is evident enough to all who have had experience in this particular field of regional surgery.

When the radical operative treatment of prostatic obstruction has been generally accepted by the profession as not only warrantable, but imperatively indicated, this particular field of genitourinary surgery will perhaps assume a plane comparable to that now occupied by ovariotomy, and cases will be operated upon so early that we will be able to formulate statistics of value. I am of opinion that the statistics up to the present time are almost valueless because of the widely varying ages and conditions of patients operated upon, the differences of opinion regarding surgical technic and the varying capacity of operators. I do not know of a field in which the individual equation of both operator and patient are more important than in the surgery of the prostate.

With the indulgence of the Association, I will devote

some special attention to the indications and technic of prostatectomy, in the belief that this part of my subject is the one which most appeals to you at the present time.

I believe that the time will arrive when the profession will accept the mere existence of permanent prostatic enlargement after middle life as an indication for prostatectomy, just as it is held in some quarters that the existence of appendicitis is an indication for the removal of the appendix. Referring back to the subject of ovariotomy, the profession has accepted the dictum that the existence of an ovarian tumor, however small, is an indication for immediate operation. Time was when the statistics of ovariotomy were not very comforting, simply because operations were performed only in extreme cases. The wonderful statistics of the operation at the present time are familiar to all of you.

I will reiterate what I have already said as to the necessity of careful supervision of the urinary apparatus in the male, in order that the early discovery of prostatic enlargement shall be practicable. It is often argued that many cases of prostatic enlargement in men at or above middle life are not incompatible with a long life, free from symptoms of obstruction of the urinary way. But given a considerable number of cases of prostatic enlargement discovered before symptoms have developed, progressive increase in the size of the prostate and eventual obstruction to the urinary outflow is inevitable in such a large majority of the cases that the few who escape should not weigh very heavily in the balance, especially when we consider that early operations are not especially dangerous. The difference in the prognosis between cases in which serious septic and renal complications have occurred with advancing years and those operated upon before these complications develop is so vast and so obvious as not to require comment. Under favorable conditions, the mortality of prostatectomy should be trifling.

Has palliative treatment any standing at the present

day in the management of enlarged prostate? There is a considerable number of cases in which operation is not to be thought of. In patients who are not only very advanced in years, but have been habituated to the use of the catheter for a prolonged period, with resultant comfort, a radical operation is usually neither indicated nor warrantable. Patients who develop retention for the first time at a very advanced age should, as a rule, not be operated upon, unless it is found to be impossible to relieve them by catheter palliation. Thus a man 75 or 80 years of age, who has been using the catheter comfortably for many years, or who has recently been attacked by retention for the first time and can be made comfortable by the use of the catheter, is hardly a fit subject for operation. The prostatique with serious renal disease usually serves merely to swell the mortality of the operation.

It is obvious that the age of the patient alone is not the crucial test of the hazard of operation. The condition of the heart, arteries and kidneys is all-important. The very old man with a history of a recent first attack of retention may endure operations which would be likely to prove fatal to a much younger man, whose heart, arteries and kidneys are unsound and bladder septic. In brief, the individual equation is nowhere more apparent than in prostatectomy.

I would class as a dangerous palliative procedure the Bottini method. I assumed a conservative attitude toward the operation from the first. Time has justified my position. I believe the cautery operation is more dangerous than perineal prostatectomy, and decidedly unsatisfactory by comparison with the latter. It is at best not to be considered as radical in its results save in a limited number of cases in which a bar exists at the vesical neck, or the prostate is enlarged in a collar-like fashion about the vesical outlet. The orthodox Bottini is scarcely to be thought of, in my opinion. When the use of the cautery is combined with a perineal opening, it is warrantable in suitable cases. The

perineal opening facilitates manipulations and readiness of access, and enables the operator to check hemorrhage and drain properly. Even where simple division of circular or bar-like obstructions at the vesical neck is alone required, other means than the cautery are usually to be preferred. Division with knife or scissors, or with a "string saw" patterned after Abbe's ingenious device for the esophagus, has proved very satisfactory in my hands.

The once-lauded testicle and cord operations for the cure of prostatic obstruction had the center of the stage for some time, and served to emphasize the necessity of caution in accepting off-hand the dicta of surgical enthusiasts in new fields of operative endeavor. The rise and fall of the operations of castration and vasectomy were worthy of the satire of a Moliere or a Smollett. The suddenness with which the more formidable operation of prostatectomy was substituted for the testicle and cord operations in certain quarters was very suggestive. Thus one eminent surgeon in a series of operations reported seven vasectomies with five cures, and immediately jumped into prostatectomy, an operation which would have been gross malpractice had his results from vasectomy been all that he claimed them to be.

Should testicle and cord operations in the treatment of prostatic obstruction be discarded *in toto?* I think not. Castration should be relegated to the dark ages of prostatic surgery, but vasectomy should be retained as a palliative procedure. It is justifiable (1) in cases in which the radical operation will not be submitted to or for any reason is not deemed wise. (2) Cases in which severe vesical hemorrhage has occurred, it is thought best to defer radical measures until improvement in the patient's general condition is shown. Vasectomy does not cure, but it palliates sufficiently often to give it a certain range of usefulness in the management of prostatic obstruction.

Selection of Operation: I am of opinion that no operation can be logically applied as a matter of routine. Perineal prostatectomy is, however, without question the ideal opera-

tion in cases in which it is applicable, and fortunately it is applicable in a vast majority of cases. There is a certain limited range of cases, however, in which the development of prostatic overgrowth is chiefly or entirely toward the vesical cavity. In some of these cases, especially in which the perineum is short, fat and deep, it is only with extreme difficulty that even the attachments of the tumors can be reached perineally. Here the suprapubic or combined suprapubic and perineal methods should be resorted to. Where complicating stone of large size exists, the suprapubic or combined routes are indicated.

With reference to the superiority of the perineal route, I believe I am justified in a somewhat positive opinion, for the reason that I entered the field of suprapubic prostatectomy very soon after its feasibility had been established, and until 10 years ago performed it as the operation of election. In a number of instances prior to 1893 I had done the combined operation. In 1893, however, I began operating by the perineal route in occasional cases, but not until the quite general adoption in this country of the perineal operation did I become convinced that it should be the operation of election.

The incision in perineal prostatectomy has received considerable attention at the hands of various operators, and many and conflicting opinions have been advanced as to the proper form of incision. The inverted Y was formerly a favorite with me, and in cases of hard, fibrous prostates, removable only by morcellement, it still appeals to me as the incision that gives readiest access to the organ. In a large majority of cases, however, the prostate is best approached by means of a short median incision, the overgrowth being removed from the urethral side.

It has not been my fortune to escape fatalities, failures and disagreeable accidents in the operation of prostatectomy. You are all familiar with the reports of large series of operations without a failure, and without a death. I have not yet succeeded in subverting the pathology of the prosta-

tique to my own surgical desires. I have no hesitancy in affirming my belief in this presence that the most careful selection of cases for operation, and the most perfect technic do not controvert the fact that the majority of patients upon whom we are privileged to operate at the present day are not only advanced in years, but have septic bladders, and a greater or less degree of secondary disease of the kidney. Knowing as we do that, to use an Irish bull, we sometimes kill prostatiques by curing them—*i. e.*, by removing the obstruction which has been damming back the urine—simply because we thereby disturb the circulation of the kidneys, which have adapted themselves to the *vis a fronte* afforded by the obstructing prostate, are we not justified in being somewhat skeptic regarding large series of successful operations, attended by no fatalities? In the light of our knowledge of the condition of the senile bladder of the average prostatique, are we not further justified in being skeptic regarding reports of operators whose work is always followed by a complete restoration of the function of the bladder? I do not believe it possible as yet to operate upon a large number of cases of pronounced prostatic enlargement without having a certain proportion of unsatisfactory results incidental to a permanent loss of function of the bladder, with perhaps a paralysis of the vesical sphincter, which the manipulations necessary in the removal of a greatly enlarged prostate sometimes render inevitable.

The perineal method of operation should of necessity be followed more frequently than the suprapubic by incontinence of urine, on account of the greater disturbance of the vesical sphincter.

The perineal operation with the median incision and the removal of the prostatic overgrowths by enucleation with the finger from the urethral side, the prostatic capsule being entered through the lateral urethral walls, should rarely be followed by urethrorectal fistula, an accident that must occasionally occur in cases in which the operation is performed with the Y incision and exposure of the rectal side of the

prostatic capsule. It is by no means necessary that the rectum be traumatized, or at least cut or torn, in order that a urethrorectal fistula shall form. I have had a case in which the rectum was intact until the eighth day, when a small buttonhole sloughed through, and a urethrorectal fistula formed. In another case infection of the wound occurred, with a slight amount of sloughing along its track, and on the twenty-first day a buttonhole sloughed through the rectum high up near the vesical neck. In one of these cases I was able to cure the fistula by subsequent plastic operation. The other patient, although comfortable and apparently restored to health, is still evacuating his urine by the rectum. On account of the advanced age of the patient, his comfortable condition and the difficulty of access to the fistula, which, as I have already remarked, is high up in the vicinity of the vesical neck, an operation for the relief of the latter has not been considered wise.

The question of drainage after perineal prostatectomy is an important one. I am aware that some very able operators claim that drainage is unnecessary, but it would be pretty difficult to convince me that the highly septic urine, found in many cases of prostatic enlargement, should be permitted to come in contact with the freshly traumatized tissues in the track of the wound, when it is possible to prevent it. I do not believe that drainage should be kept up for a prolonged period, but I feel confident that it is safer to drain by a fairly rigid tube, surrounded by light gauze packing, for the first few days after a prostatectomy.

To sum up what I believe to be the correct attitude toward prostatic enlargement:

1. Prostatic enlargement is not a senile condition in the strict sense of the term, its causes prevailing at a period of life much earlier than the development of the symptoms. Infection and chronic congestion are important etiologic factors occurring at a relatively early period.

2. Prostatic surgery will never be developed to a plane even approaching perfection until the profession at large

understands the necessity of a careful supervision of the genitourinary apparatus in the male, permitting of early discovery of prostatic obstruction.

3. Operations upon the prostate prior to the development of septic complications in the bladder and kidneys, and prior to pressure changes in the latter organ, are not necessarily formidable.

4. The indication for operation is the existence of a prostatic tumor, this being qualified only by delay in the discovery of the condition, and the supervention of serious complications. Under the latter circumstances, palliation may be required.

5. Palliation by the catheter or by vasectomy is only to be considered in cases in which, for one reason or another, a radical operation is absolutely contraindicated. Catheter life should never be begun save with the understanding that the expectancy of life is relatively short, probably on the average not more than five years.

6. Cases in which prolonged and comfortable catheter life has been shown to be practicable are to be accepted as merely exceptions to the rule as to the diminished longevity of the catheter victim.

7. No operation can be used in all cases as a matter of routine.

8. Perineal prostatectomy, skilfully performed, is the operation of election.

9. The statistics of operations upon the prostate up to the present time are not of great value, because of the wide variation in the skill of operators, and the age and condition of patients.

10. As cases are nowadays brought to us for operation, a greater or less percentage of fatalities, accidents and unsatisfactory results must be expected. No method of operation has yet succeeded in revolutionizing the old man's pathology. Ideal conditions for the radical surgery of the prostate will not prevail until the average age of patients submitted to prostatectomy is many years below that of the

patients upon whom we are at present operating. The age of the patient is, however, not so important as the length of time since the beginning of catheter life, or of serious symptoms. The old man of 70 years of age, who has had his first attack of retention within a few weeks or even a few months, is a much more favorable subject for operation, other things being equal, than a man some years younger, who has had many attacks of retention, and a more or less prolonged catheter life.

Address of the President

By Charles S. Hamilton, M. D., Columbus

I wish first to express my high appreciation of the honor which you have conferred upon me in electing me to your presidency, and my anxiety to fulfill the duties of the office in a manner which shall be satisfactory to you.

In view of the length of your program and the many important and interesting topics of a purely scientific character which will claim your attention, I shall refer as briefly as possible to certain matters which concern us in connection with our reorganization and, in a general way as well, in place of occupying your time in the presentation of a technical subject.

This great Association, which has more than 2,500 members and is so constituted that it will have eventually component societies in every county in the State, represents a new era in our profession. It means not only union of the profession for the more unselfish purpose of the science of medicine and public health, but also a wise and legitimate combination of individuals for the welfare of the medical body as a whole. That so large and yet so compact an organization may wield a great power, needs no demonstration. Contemporary history is full of proofs. No more striking instance in a small way is known to me than what occurred in the last session of the House of Representatives in Columbus.

The medical students of the Class of 1904 had organized to secure exemption from the State examination which otherwise they must pass before acquiring the right to practice. Your Legislative Committee met the House Committee on Universities in a public discussion of the subject, attended by the students and their attorneys, as well as by teachers in various colleges in the State. While the contention of the students that the law could not with justice apply to them, but rather to the next succeeding class, was ably and determinedly opposed, it was evident that the sympathies of the Committee were with the students.

A few days later when the bill was to come to a vote in the House a careful estimate of the situation indicated that it would pass by a considerable majority. At that juncture a member of your Legislative Committee conceived the idea of flooding the House with telegrams from the presidents of county societies, addressed to their various Representatives, protesting forcibly against the passage of the amendment. The result was an absolute reversal of the vote and the bill was lost. Such is a comparatively small influence which you have exerted. An occurrence of this kind impresses us with a sense of new power. It makes us realize that we are no longer a merely academic organization, but that we constitute a political and social power which must be reckoned with by the legislative and governing bodies of the State. When the public shall have learned that our organization exists, has large numbers and a determined spirit, any reasonable demand on its part will meet with the respectful and courteous consideration which it deserves. Our sphere of activity becomes at once far greater, our responsibilities are heavier, and our dignity is enhanced.

It is not to be hoped that a scheme of such magnitude as the organization of the entire profession of a great nation on new lines should be consummated without opposition. On the whole there has been less than one would expect. Some has been manifested by men of a familiar type—those who on principle resist innovation of any kind. Such men are

not open to the influence of reason and argument, and would have been found in opposition to whatever change had been proposed. On the other hand there is, if not opposition, at least a lack of sympathy on the part of some of the best and most honored of our profession who sincerely object to various features of the plan, while they approve its general purpose. It is our hope that time and the success of the organization will convince them of the wisdom of the new order of things.

The objection has also been raised that the control of the organization will be too highly centralized and not sufficiently democratic; that there will be a "ring" in power. There is no very manifest reason why we should be more readily dominated by a clique now than under the old régime. The new organization will be controlled by those who are active in its affairs and are willing to give it their time and attention. Any man who has the requisite qualifications and is willing to work, may, if he wishes, be prominent in the government of the body. If the members become indifferent and fail to exercise their prerogatives a "ring" may come into existence. No one is rash enough to maintain that the structure of the organization is perfect; it is probably the best available and thus far its results are satisfactory.

The actual work of the reorganization has fallen upon a few—much of it upon the Councilors. They have given their time and labor to an extent that few of us appreciate, and deserve our heartiest thanks. It is to be expected that their successors will by continued effort keep alive the weaker county societies which the officers of today have brought into existence. Upon the efficiency of the Councilors and Secretary in fact will depend to a great extent the permanence of the work. They are the most important officers of our Association and should hence be chosen with the utmost care. The life of the Association between its annual meetings is maintained by them. However, we must recognize this fact, that the ultimate fate of the organization depends also upon the individual member, upon his realiza-

tion of his duty to the profession and to himself. He must attend the meetings of the county societies, participate in the work and show publicly that he identifies himself with the movement. Otherwise after the first enthusiasm which attends any great reform, the organization may lapse into a condition of hopeless and helpless inactivity.

Admitting that the final outcome of our Association depends upon the component individuals as well as upon the organizers and leaders, the importance of the character of the membership of county societies becomes at once apparent. We have passed through a period in which the criteria of membership were narrow and contracted. The spirit which characterizes the present day directs that we abolish as completely as possible distinctions between sects and schools in the consummation of union for mutual welfare. No matter what the therapeutic or physiologic dogma which we represent, our interests and aims are alike. The various schools should harmoniously pursue the ends which they know to be desirable and necessary. Too much honor cannot be given our State Board of Registration—a notable example of the best work of the schools acting in concert for a common purpose.

I take it that the most important purpose of this organization is not social in the more restricted sense of the word, but, quoting the constitution of the county societies, to secure "such intelligent unity and harmony in every phase of their labor as will elevate and make effective public health, material and social affairs." The objection of a member to an applicant for membership resting on personal grounds alone, should have no weight. "Every legally registered physician residing and practicing in ———— County, who is of good moral and professional standing and who does not practice sectarian medicine shall be eligible for membership." The statement of the Constitution as to eligibility is quite definite and should be broadly applied. Absolutely indiscriminate admission to membership, however, is to be condemned. It is desirable that something tangible

should distinguish the members as a class from those who cannot be members. The man who in any way uses his superior knowledge and education as a means of imposing on ignorant and credulous, or who habitually violates the laws of ordinary medical decency, has no place in our Association. We cannot afford to grant the sanction of membership to those who might bring discredit upon us. Our organization will not continue to hold the loyal and enthusiastic support of its members if it fails to maintain a certain definite standard of qualification for membership.

By a wise provision of our Constitution the business of the Association is largely transacted by a House of Delegates. The delegates are representatives elected by the various county societies. It is their function to vote on the disposition of current business, but in matters involving serious difference of opinion or controversy in the profession they should voice the prevailing sentiments of their electing bodies. They are members of the House of Delegates in order that the wishes of their county societies may be expressed and defended. The society should instruct them in important matters pending before the State body, in which it desires to take a stand. Their power is very materially limited by the clause in the Constitution which gives the general session the power to order a referendum on any question pending before the delegates. It has been suggested that at the various general sessions of the Association the Secretary should report the transactions of the delegates during their last previous sitting and announce the subjects which will come before the House at its next meeting. In this way the members who are not delegates will be thoroughly conversant with the business of the Association, even though they may not desire to attend the sessions of the delegates.

In my judgment there has been one radical defect in our working plan. The State Association meets at a given time, is well attended and a lively interest displayed in the business as well as the scientific work of the organization.

At the close of the meeting the members separate, and the State body ceases to exist so far as they are concerned, until a short time before its next annual gathering. With the officers, and particularly the Councilors, it is different. Their duties keep them more or less in touch with the Association and its aims. It behooves us to inquire how a more continuous interest can be maintained during the year.

The transactions, as now issued, come to the members at so late a date, so near the time for the next meeting, that all interest in them is quite lost in that which centers on the approaching annual session, and the volume is rarely opened by the members. There is a growing sentiment in favor of the publication of the transactions in some other form. The ideal plan would be the ownership of a journal as the organ of our body and for the publication of its proceedings. Practically the creation of a journal for the purpose would be a great and costly undertaking, to be entered upon only after careful consideration and with the assurance of good financial backing. The best immediate substitute is to establish such a relation to a journal, or to several journals if found expedient, as will give us at least a few of the advantages which we desire, without our assuming the risk of proprietorship. In this way the members could be kept in constant touch with the work of the Legislative Committee. This alone is a mater of great importance. We expect to continue an active, working organization with positive views and serious interests. We should, therefore, have a means of voicing our sentiments and keeping our members informed of all that is of interest to them. The advantages are so manifest that the plan commends itself at once to favor. Several propositions from medical journals will be submitted to your delegates at this session. While their propositions vary in their details all of them embody at least one feature worthy of consideration, *viz.*, furnishing the transactions to the members at a less expense than is now incurred for the same purpose.

In the broader field which our Association now occupies will be encountered additional duties and responsibilities, proportionate to the increased power and influence which we possess. Time forbids more than a mere allusion to a few of them. We should claim as our due, representation of the profession on the Boards of Trustees of the various State Hospitals and Asylums. At the present time but few medical men hold such positions. Their value to the institutions when acting in this capacity is self-evident. Without their influence the scientific work of the hospitals will receive inadequate consideration at the hands of the various boards composed largely of men who study with interest the economic problems which confront them, but fail to appreciate the value of scientific investigation of pathologic materials.

The State has just appropriated a considerable sum of money to be devoted to the establishment of a sanatorium for tuberculosis. The Association should give careful attention to the plan for the proposed sanatorium, in order to secure any modifications which it may consider desirable while the project is in its formative stage.

At its last session your Association expressed its approval of the creation of a State Pathological Laboratory to be located at Columbus and associated with the State Univerity, and to a certain extent under the control of the Ohio State Medical Association. The idea is meritorious and should continue to receive your vigorous support.

It is much to be regretted that the Legislature adjourned without action on the Reciprocity law, as well as without passing a State law for registration of Vital Statistics. Both these measures are of great importance and deserve your hearty endorsement, the first as a matter of justice to members of the profession who suffer injury from the prevailing difference in medical laws of the several States, the second on account of its evident importance to the community in various ways. Other States have taken action with respect to both of these questions; it depends upon you to see that Ohio shall speedily follow their good example.

CHAPTER III—MEDICINE

Syphilis of the Stomach

By Charles F. Hoover, M. D., Cleveland

Syphilis of the stomach is a syphilitic manifestation which, until recent years, has been very little considered in differential diagnosis. The varied characters of syphilis of the stomach, and the symptoms it may produce, have so many points in common with other diseases that the diagnosis during life must rest finally on the therapeutic test. The therapeutic test in syphilis does not imply the relative inaccuracy which that term suggests in other fields of pathology. Pathologists recognize the uncertainty of histologic diagnosis in syphilitic structures and concede the therapeutic test to be as certain a diagnostic measure as any we have at our command. The three cases I have to report each presented entirely different symptoms. One case may have been ulcerative, one the diffusely sclerotic form, and one a gummatous growth causing pyloric obstruction. In none of the cases was there a palpable tumor or area of maximum tenderness. In two cases the only symptoms referable directly to the stomach were pain and vomiting after the ingestion of food. Nothing abnormal could be detected on physical examination so far as the stomach itself was concerned. In one case the stomach was dilated a hand's breadth below the umbilicus. Retention of chyme and poracous vomiting were continually present and distressing but no tumor nor area of tenderness could be detected. In two of the cases there was only a clear history of syphilis

16 and 20 years prior to the time they came under my observation, but no evidences of syphilis were apparent on physical examination. In one case there was a saddle nose and perforated soft palate which had been acquired about 25 years before.

Unless the physician is strongly impressed with the possibility of syphilis being the etiologic factor, iodid of potassium will not be given on account of its irritating properties to the stomach. When in doubt give iodid of potassium is a maxim easily followed when the stomach is not at fault. It is the line of least resistance. But the administration of iodid of potassium in a doubtful case in which gastric pain and vomiting are the conspicuous symptoms is abhorrent to the mind of the therapeutist unless the idea of syphilis is paramount in his speculations. Failure to recognize the true character of syphilis of the viscera is always followed by a calamity, whereas no work of the physician gives such gratifying results as the proper treatment of visceral syphilis.

The first patient, a woman 40 years old, seen first by me a year and a half ago, gave a history strongly suggestive of hyperchlorhydria (with gastrosuccorrhea) but possibly accompanied by ulcer. There had been no loss in weight or color but there was always severe pain within half an hour after eating any kind of food, solid or liquid. When the pain was severe small amounts of food were vomited but she seemed never to completely empty the stomach during these vomiting attacks. Pain and belching of gas without relief occurred nearly every night and caused much loss of sleep. There was a relish for food but fear of distress deterred her from eating as much as she liked. The stomach-tube was passed with considerable difficulty after an Ewald test-breakfast, but only a very small amount of thick chyme was procured, not sufficient to give a filtrate. This gave a reaction for free hydrochloric acid, *viz.*, moistening congo red paper and then warming it over a flame, after which the blue color remained. The patient stoutly refused to allow the passage of a stomach-tube a second time. The stomach was not dilated. There was no succussion, no tenderness on palpation and no thickening or tumor palpable. There was a very definite history of syphilis 16 years before, for

which she was treated six months. Since that time there has been no return of any syphilitic manifestation. Iodid of potassium was given in doses of five drops of the saturated solution three times daily and increased to 10 drops three times daily. More than this caused pain and nausea, but so long as the dose was not larger than 10 drops it was well tolerated and all symptoms disappeared after three weeks' treatment. The patient was not convinced of the correctness of the diagnosis and discontinued the medicine after about six weeks. A year later the symptoms returned and she again consulted me. The iodid of potash in small doses three drops *t. i. d.* was begun and well tolerated. Improvement promptly began and the dose was increased to 10 drops *t. i. d.* The patient was told to continue the medicine for several months but has not since been seen by me. Pain and vomiting, which was twice relieved by the same treatment without any strict modification of diet, I think, will justify a diagnosis of syphilis.

The second patient, a man 50 years old, was seen in a remote country district a year ago. The patient had vomited all ingested food for six weeks. There was constant epigastric pain, but no evidences of retention of chyme. The patient was emaciated, profoundly anemic and greatly prostrated. He was unable to sit up in bed. There was a saddle nose and perforation of the soft palate in the median line near the hard palate. The hole was large enough to admit a goose quill. These defects were acquired 25 years before. The patient had two healthy children 18 and 20 years old. His wife died a year previous to this time from what was supposed to have been cancer of the stomach and liver. During his wife's last illness he had an attack exactly like the one with which he was then suffering and was said to have been reduced to nearly the same condition. His physician out of sheer desperation gave him iodid of potash 10 grains *t. i. d.* and improvement began directly. After six weeks the medicine was discontinued and the patient considered himself well until the last attack of vomiting commenced. Besides the signs above described there was nothing demonstrable on physical examination. The stomach was not dilated nor sensitive to pressure, nor could any thickening or tumor be detected. The patient had drunk a half hour before a few ounces of panopeptone. The stomach-tube was passed and the whole amount recovered

unchanged in appearance and gave the reaction of free hydrochloric acid to congo red. Iodid of potash was advised but the patient died a few days afterward. No autopsy was held.

This patient was undoubtedly syphilitic and recovered a year before from symptoms identical with those which a year later resulted in death. The first attack was treated with iodid of potash, the second attack was not so treated and death resulted. Such a history I think will justify a diagnosis of syphilis of the stomach. Both of these patients were examined for any disease of the central nervous system which might account for the vomiting but there were absolutely no symptoms or physical signs which would justify a suspicion of any of the parasyphilitic affections of the brain or cord.

The third patient, a man 48 years old, had been suffering from epigastric pain, constant nausea and frequent vomiting of food and a thin green liquid for two months prior to the time he came under my observation. The patient was markedly emaciated, very weak, the skin dry and rough; the lips were pale. He was passing a small amount of urine which was free from sugar and albumin. Constant thirst was not relieved by drinking water. On physical examination the only signs which could be elicited were those of a greatly dilated stomach, which extended a hand's breadth below the costal border. Succussion could be distinctly palpated from the lower border of the stomach to the left hypochondrium as high as the eighth rib in the axillary line. The peristaltic action of the stomach was plainly visible and very active.

The stomach-tube was passed and a half pint of thin green liquid free from hydrochloric acid was withdrawn from the stomach, but the patient would not tolerate the tube a sufficient length of time to permit a complete evacuation of the stomach. A conservative estimate would be about a quart of chyme retained in the stomach. There was no tenderness over the stomach and no resistance or tumor palpable in the pyloric region. The patient gave a clear history of syphilitic infection 20 years before, for which he was treated at the time. There has been no recurrence of any syphilitic symptoms since. He has one healthy

child 15 years old. His wife has had no miscarriages. There were no signs on physical examination which could arouse any suspicion of an old syphilis besides the stomach symptoms.

The patient was given iodid of potash in doses of five grains *t. i. d.* and increased the dose two drops daily until 25 drops *t. i. d.* were taken. Iodid in these doses was not well tolerated and the dose was reduced to 10 drops, which he took without discomfort. Directly the iodid of potash was administered the patient improved. The diet was restricted to liquids. At the end of a month's treatment solids in small amounts were added to the diet. Improvement was constant until at the expiration of three months the lower border of the stomach was above the umbilicus and the patient was able to take a full diet without discomfort. His color and weight now give all the appearances of perfect health.

Some Observations by a General Practitioner

By H. B. Gibbon, M. D., Tiffin

In reporting "Some Observations by a General Practitioner" of medicine and surgery, I have selected only those cases that are of particular interest, because of the rarity of the first, the uncertainty of the pathology of the second, of the departure from the old line of treatment in the third, and because of the gloomy prognosis in the last. I hope, by a continuous agitation of these subjects, to awaken a deeper interest among the profession to a more careful examination of their patients, and an earlier detection of the anomalies of the first class; a more charitable consideration of the second; a fair and impartial trial of the recommendations of the third; and a more guarded prognosis in the last.

Without further comment, I shall report the cases, and leave the matter for your consideration:

Mrs A., farmer's wife, aged about 30, had suffered from none of the prevailing diseases except those incident to childhood. The family history was negative. I was requested to

see the patient by Dr C. T. Benner, at his office, where the patient had come to consult the Doctor in regard to her condition. She gave the following history:

She considered herself pregnant and had passed through the period of gestation without suspicion of anything, other than normal, and at the suspected time of confinement was taken with what they considered labor pains. They at once sent for their physician. Soon after his arrival, the pains subsided; and they awaited further developments, but as the pains had not again come on, and as she had not felt motion of the child from that time of apparent effort at labor, she thought that something was wrong, as about a month's time had passed, and according to her count she was just that length of time past due.

An examination disclosed the following: She had been married for about 10 years, when her first pregnancy took place. A vaginal examination showed that the uterus was carried well up against the pubic arch so that the neck could be but indistinctly mapped out. It was small and undeveloped. To the left, and continuous with the enlargement felt through the vagina, was an enlargement extending up to the costal cartilege, which fluctuated quite distinctly. This, with her history, made a very clear case for diagnosis, in which we concurred with that of Dr Benner, that we had to deal with an extraperitoneal pregnancy, anterior, left side. An operation was recommended and accepted by the patient. I assisted Dr Benner in the operation on October 10, 1900.

We found the fetus extraperitoneal, anterior, which had evidently been dead from the time of abortive effort at labor. The placenta was almost completely detached, and was removed without any difficulty, and the hemorrhage was *nil.* The cavity was packed and recovery was entirely without event. I was requested by the Doctor to see the same patient at his office about 14 months after this, at which time we found a ruptured tubal pregnancy on the right side. She was suffering but little inconvenience and selected to await developments, and she is still waiting and has every appearance of a healthful condition. We are of the opinion that the products of conception have been encysted and she is today to all appearances well and hearty.

Mrs R., aged about 30, a farmer's wife, had always been well, except such diseases as are incident to childhood.

I was called by her attending physician, Dr Steel, to see her on October 31, 1903. The history gained from the patient was very imperfect. There had been an irregularity of the menstrual function for the past three months. Her condition, at this time, was not good. Her skin was sallow, the cheeks flushed, pulse rate 125, small and thready, temperature 101°. She had lost in weight and had been confined to the bed for the past two weeks with an occasional chill and sweat. There was marked tenderness over the lower belly with decided muscular rigidity, but no perceptable fulness of the suprapubic region. A vaginal examination revealed a fluctuating mass entirely filling the pelvis. The womb was lifted well up under the pubes directly anterior, so that I could not outline even the cervix. The mass was very tender and fluctuation could be easily elicited. The vaginal wall was so distended that it appeared to be on the point of rupture. The case took on the characteristics rather of an suppurating hematocele than that of ectopic gestation. We advised immediate operation, which was accepted, and we opened through the vaginal wall the next day. We found and delievered a four months' fetus well formed, packed the cavity and our patient made a good recovery.

I believe that there are many cases of ectopic gestation that are overlooked, more especially those cases in which the fetus dies at the time of rupture of the tube. The symptoms in some of these cases are very light. The shock may be almost or entirely imperceptible, the pain may subside in a day or two, and the inflammatory action be so mild as to escape detection, or considered to be due to an attack of dysmenorrhea, the result of so-called natural causes. I would urge upon the profession the necessity of a more thorough examination when called to see a patient who is complaining of pain in the lower belly, with tenderness, and who is having slight showing of blood, giving a history of irregularity in the menstrual function during the past two or three last periods. It is important that the physician satisfy himself of the existence, or of the non-existence of ectopic gestation.

Second: The excuse that I have to offer for reporting this case is that while it is a railroad injury, in that it occurred in a railroad wreck, it lacks many of the essential features necessary to that classification recognized as railroad spine. It is unfortunate that these cases cannot be classified with reference to their pathology, but as their pathology is unknown, and their symptomatology, being wholly subjective, is as variable as the temperaments of different individuals, and in many cases recovery is apparently influenced and hastened by a liberal compensation; which acts as a soothing application to their hurt sensibilities and like a balm of unknown proportions, transforms their aching nerves forever into a state of *"innocuous desuetude."* Their clinical history is as uncertain as their pathology. Unfortunately these cases have no place in our text-books on medicine and are treated as though they were all imaginary ills and that every person claiming injury of this character, or type, are considered as malingerers. Therefore those that actually suffer from injury are the recipients of very little sympathy and are often deprived of a just and impartial hearing. I fear, gentlemen, that this is the light in which we are too prone to view these cases, and that we are too apt to think that a satisfied demand for injuries, claimed by the unfortunate sufferer, should be a bar to their ultimate recovery.

Mr A., aged about 35, of good family history, had always been healthy, never having been afflicted with other than diseases of childhood, while in pursuit of his avocation, that of a postal clerk, was injured in a collision near Chicago, Ill., March 28, 1900. After the receipt of the injury he came to Tiffin and walked to my office where the following injuries were noted: A lacerated scalp-wound two and one-quarter inches in length, two and a half inches above and one inch back of the left ear was found; also a fracture of the ninth rib on the same side. There was no evidence of any other bodily injury. I was called to the patient's residence the next day, at which time he was complaining of tenderness

over the belly, which was attended with elevation of temperature, and a well-defined rigidity of the muscles of the abdomen. This condition continued for nearly a week. He then began to complain of insomnia and pain in the muscles of the back and legs. Although there has been a subsidence of all the symptoms, except the pain in the back, which has continued, nothwithstanding I have tried rest, counter-irritation, blisters, the electric current, etc. There has not been, at any time, loss of function of the muscles of the legs, nor any perceptible disturbance of the reflexes, neither hyperasthesia nor anesthesia. The sexual function has not been disturbed, nor have the sphincters at any time been impaired. He walks with a shuffling gait, so much so that he wears the heel of his shoes very rapidly. He has not been able to do any sort of labor that requires him to bend the back, without complaining of extreme pain and soreness in the back following such an effort.

Taking into consideration the very conspicuous absence of atrophic changes, of anesthesia, hyperasthesia, and perverted function of the procreative organs, also of the normal activity of the sphincters, and the persistency of the symptoms, before enumerated, I am of the opinion that we must look to the ligaments entering into the formation of the articulations, and the fibrinous attachments of the muscles to the various articular processes rather than to that of injury of the spinal nerves for our pathology.

The restoration of these lesions are analogous to that of the knee or any other articulation, in that it is slow to repair, very susceptible to a chronic inflammatory action, which is likely to prolong the usually tedious process.

Third: I would like to recommend to your consideration a more careful and scientific treatment of the periosteum, in open fractures and in all bone surgery. I believe that my experience during the past few years justifies me in calling the attention of the profession to a more considerate treatment of this membrane than it has been receiving at the hands of the profession at large. I have made it the rule in all cases

of bone work to be as particular to close the periosteum as I am of the tissues superficially to it. It matters not how extensive the work nor how much bone sacrificed, I as carefully adjust the periosteum with as much confidence of new bone formation as I am of tissue union. The procedure has much to commend it as it does away with a protracted convalescence, and with the unsightly scar, and the tissues are not bound down to the bone as is the case in the old and commonly practiced open granulating process. I am also persuaded that in cases of compound fractures that if we would (if need be in order that we may have sufficient room to do the work well) enlarge the opening, thoroughly cleanse the parts, adjust the bones, and then close the periosteum, with or without drainage, as the case may indicate, our results would be of such a gratifying character as to well repay us for our time and skill. With our present knowledge of cleanliness and our surgical skill, I am not so certain but that in many cases of comminuted fractures, we would furnish better results if we laid the parts open, turned out the clots, ligated the bleeding vessels, coapted the fragments, closing the periosteum and then the tissues superficial to this with or without drainage, as your judgment dictates in each individual case.

Fourth: I wish to state that my observations in fractures at the hip do not justify the gloomy prognosis that is usually given in such injuries. In a paper that I read at the Toledo meeting of the Northwestern Medical Society in 1900, I then reported 15 cases of fracture at the hip in patients whose ages ranged from 28 to 86 years, which had come under my observation, in my own, and in consultation practice, with but two deaths occurring, and only one of these might be considered to be due to the injury *per se*. The one was reported to me by the attending physician with whom I had seen the patient in consultation. The other death was in a patient under my own care who died, in the second week after her injury, from an intercurrent pneumonia, as a complication of an old organic heart lesion,

in a lady some 60 years of age. Since that report I have seen two more patients suffering from fracture at the hip. One was a patient in my own practice, and in a lady of about 50 years, who made a good recovery, with a useful leg. The other was a patient seen in consultation. She was 93 years of age. She lived five weeks after the receipt of the injury, and died from other causes. The hip was examined after death by a competent physician. While the family would not permit a section, the physician satisfied himself that very firm union had taken place. The parts were well adherent and firmly fixed together.

Therefore, from my experience and observations of fractures at the hip, I must say that the usually gloomy prognosis is unwarranted both as regards the future usefulness of the leg and as to mortality.

The Open Air Treatment of Tuberculosis in Northern Ohio

By John P. Sawyer, M. D., Cleveland

Since residence in favorable climates is possible for but few of the whole number of tubercular cases, our closest thought is demanded to what may be done for the numerous victims of this infection under those conditions in which they must continue existence and the struggle for it at home. The overwhelming majority of tubercular patients must be treated at home, or close to it, no choice being allowed.

From the experience of many sanitoria conducted in many altitudes and many latitudes we are now appreciating the fact that for each case its later clinical history is a result of contending forces, of which the physiologic is our ally: and this tendency toward health may be powerfully assisted in every climate by adopting a manner of living which embodies the measures common to all institutions and treatments whose results meet our standard of success.

As experience grows, a conviction is growing that of the many cases precipitately packed off to secure a change of climate a large proportion may do better, and do it with less sacrifice of material interests, at home.

To support this statement of opinion it is necessary to recognize not only the occasional brilliant results from change of climate which have inspired us to insist on the up-rooting of the social life of the consumptive and the pinching sacrifices often made by families for their unfortunate members; but also it is the part of wisdom to consider the successful cases treated at home, with a careful scrutiny of the likelihood of all the conditions necessary for success being fulfilled if the home is deserted.

First let us give heed to the warnings of our colleagues in all sanitoria and in every climate, and with their protests against the sending of unfavorable cases ringing in our ears we are less likely to feel our duty done with the giving of the diagnosis and the edict: "away with you to Colorado, California, Carolina, or any other place where some have recovered," while with fatuous self-complacency or lazily constructed judgment we hide the unsuccessful attempts behind a fatalist's "kismet."

I do not need to recount these warnings from the experienced and able physicians in whose care have been placed thousands of tubercular patients in the chosen regions of our land. What we have forgotten, and as a profession too commonly neglect, is to copy at home the universal requirements of the successful hygiene adopted in these great foci of the struggle against tuberculosis.

We have also forgotten that the natural defenses of the body may be most efficiently strengthened by procedures which are other than those of dosing by teaspoon and capsule.

It has been the common practice to protect the patient with incipient tuberculosis from any slightest exposure to air, from inequalities of temperature, to rigorously see that no cold water touches them "lest they take cold." In our steam and furnace-heated buildings with sleeping arrange-

ments and living habits adjusted to these requirements the tubercular patient in this region has especially suffered from the lowered physiologic tonus which results, and of the whole population many not yet tubercular become good soil for the same reason; so that protection over-reaches itself and becomes an invitation to infection and an accessory to its complete development.

While wishing to avoid any appearance of neglecting other measures which are of great value, I desire today to call attention to the fact that though our climate is not ideal we may still gain in it for our patients much which is now often lost.

This past winter has been a most rigorous and trying one in this section and what can have been done here in this year may be done almost in any part of the State. During the past winter and the year before, I have had a number of patients pursuing, as far as possible, under their individual conditions and in association with other measures, open air living as a means of heightening their resistance against a demonstrated tubercular infection and in some instances as a means of improving their tone and vigor when unable to find tubercle bacilli in any secretion. I shall not weary you with the complete report of these cases but wish to present the following observations:

Of the whole number several were able to make extensive use of open air living, some whose temperature reached 102° in the afternoon, occasionally rising as high as 103° F., were brought to rest on couches or reclining chairs during the day upon porches protected against direct winds but in free air.

These and also a larger number whose occupation prevented this complete rest, and whose temperature did not require it, have slept on porches; in a few instances in rooms with two to four windows widely open throughout this winter; zero temperature and lower not discommoding them nor causing any hardship of which the slightest complaint was made. Our coldest recorded temperature was 4° below

zero and this night all slept out with comfort, adopting only the measures which are followed in all sanitoria at the present time.

Without exception the patients thus treated report that they acquire a dislike for sleeping in the house and a sense of oppression also when attempting it. A few nights a violent wind has caused such a flapping of canvas or noise otherwise associated with it, that sleep has been impossible and they have been compelled to go in doors. This has been but two or three times in any case.

I shall not give the details of all but will narrate a couple of typical cases which I think will go to show the marked benefit derived from this plan combined with other measures, the neglect of which is just as culpable as in any case failure to do all that we can is poor treatment, while no criticism is to be laid against the partial measures actually chosen.

Mr H. consulted me July 17, 1903, complaining of weakness, prostration, and loss of flesh and slight cough. On physical examination the following essential positive observations were made: Slight dulness over both apices anteriorly and posteriorly, a few scattered râles more pronounced on the left upper lobe anteriorly, while on the posterior surface in both lobes the râles were more numerous and larger on the right more than on the left.

The patient has a ptosed atonic stomach without catarrhal gastritis, with free hydrochloric acid 78, total acidity 152. The temperature was 98.8°; the pulse 98; the weight 113. The urine had a specific gravity of 1020, a trace of albumin, no indican and no sugar, bile reaction positive; microscopically a few hyaline and dark granular casts were noted in number and appearance such as commonly seen in cases of moderate icterus.

The sputum was examined July 17, no tubercle bacilli being found. July 23 a few bacilli were found, the 25 and 27 none were demonstrated while on the 28 several were clearly recognized.

The patient was put upon olive oil before his meals, milk of magnesia and Vichy water to correct the excessive acidity, a diet was given with hygienic regulations for his meals, and the patient was directed to sleep out of doors as much as possible.

October 23 he reports great improvement and a gain of 12 pounds in weight in three months. He says he "has not worked so hard in a long time." This was quite significant, as when he came he felt himself unable to carry on his work and was trying to see if some work of different character than that of a cutter in a large tailoring establishment could not be found. December 16 he reports still better, his weight being 130 pounds. May 16, 1904, the patient reports weight 130 pounds, pulse 68, temperature normal, and says that since the time he was 20 his best weight has been 130 pounds and expresses himself as feeling well and strong and has enjoyed the open air sleeping and the cold bathing in the morning, and says that it is now impossible for him to sleep in close rooms.

Mr M., the head accountant of a large retail business, has not been feeling well for some time past. His temperature is 99.4°, and pulse 112. He is pale, always slight in build, looks pinched and unusually thin, weighs 135 pounds, average weight being 138 pounds hitherto. His appetite is pretty fair, the bowels regular, sleep good, but says he has a slight cough.

On physical examination the patient shows the following findings; in both apices anteriorly, left more than right, a slight dulness on percussion is noticed, with a few râles more noticeable in the left apex than in the right. Posteriorly the lower lobe of the right lung below the point of the scapula shows also a slight area of infiltration with a few moist râles, vocal fremitus is markedly more than on the right side and more than normal. A few glands are just palpable in either axilla.

The urinary examinations were the same as in the preceding case, a mere trace of albumin, a positive reaction for bile, and a few hyaline casts only were noted. The sputum sent March 6 showed no tubercle bacilli. On March 11, 13 and 16 tubercle bacilli were found in considerable numbers. The patient was put upon benzosol, three grains, three times a day, solution of hypophosphite compound, a tablespoonful twice a day, and was directed to adopt cold sponging and sleep out of doors. Under this he has steadily improved and August 13, having been up the Lakes for a week, his weight was 139 pounds. On October 29, he weighed 142 pounds, more than ever before in his life, and but for my positive assurance to the contrary would have believed him-

self a well man. May 16, 1904, the patient reports that he never felt better in his life, his weight is 144 pounds, more than he ever weighed.

There is no cough, very little dyspeptic disturbance, and on physical examination the temperature is normal, the pulse is 78; on examination of the lung, while there is a slight dulness, there are no râles. A cog-wheel respiration is noticed in the right third interspace. A few glands are palpable in either axilla.

A further report of examination of cases is not here desirable but I hope that other physicians who have had active charge of some of these cases will mention them in discussion. These are fair examples of statements made, and of the physical results shown by the other cases.

The least favorable case is one with a well-developed exophthalmic goiter, but in this case a great gain has been made and the physiologic findings show positive improvement.

I may, therefore, say that in a dozen cases, without exception there has been universally expressed benefit and improvement in the physical signs in each case in which there has been sleeping, at least with wide open windows, the following up of open air living in all conditions of weather here in Cleveland and the immediately adjoining territory.

It is not necessary to point out that no claim is made of the specific cure and that it is particularly desired to avoid the impression that this procedure alone is sufficient, but what I have sought to establish by these cases is that it is perfectly feasible to practice out-of-door living in all conditions of weather here in this region with great gain resulting to the patient, this out-of-door living being a most generally adopted practice in modern sanitoria.

From such considerations arises the increased desirability of numerous well-conducted sanitoria or rest homes for the tubercular, and it is in my judgment a fair proposition that when with the ordinary measures of drugs we shall have established the universal practice of open air, rest and hydrotherapy in these cases, we shall have a much less unfavorable

prognosis for many of our cases, with greatly increased efficiency in providing for the comfort and lengthening of life for those for whom cure is impossible.

DISCUSSION

Dr D. N. Kinsman, Columbus: I am glad to see that consumption, or rather tuberculosis, is getting the attention that it needs, and that people are beginning to utilize good-sense treatment in this disease. Doctors and patients alike are learning that it is not necessary to go to Colorado, or any of these health resorts where they have sunshine forever in order to be benefited. I am quite sure, however, that those climates which have the largest proportion of sunlight are the most favorable ones in which to treat these cases. Four years ago, in the spring of the year, four girls, each of whom had evidence of disease in the apices of both lungs, were doing housework in Columbus. They were directed then to go to their homes in the country, to spend the days where there were trees and grass, to avoid all kinds of dust, and at the same time expose their chests and bodies as far as the hips to the sunlight with a simple plain jaconet covering upon them. These girls returned to the city about October tanned as brown as it was possible; there was no trouble as indicated by rales, etc., in their lungs, and they have remained well since. I believe these were cases of tuberculosis arrested by exposure to open air. These girls lived practically out of doors, and at night all the doors and windows of the upper rooms were thrown wide open for full ventilation. I have been in the habit of sending patients to the top of the Allegheny Mountains where there is a hotel which is not furnished according to modern ideas. The floors are made of plain boards and are without carpets. Patients spend practically their whole time out of doors. I have had four patients who spent their time in the open air return benefited. That is what I am advising all of my patients to do. They do not need a climate which is less rigorous than that of Ohio to get beneficial results. Witness results obtained in the sanitarium at Rutland, Mass., where the buildings occupy the bleakest hills in the State, and are open the year around. There are no sanitaria which report more favorable results than those in that State which has not a model climate. There is one thing certain and that is that tuberculosis need not be dreaded

as it has been. At the Asylum for the Insane in Columbus I saw two or three days ago a group of 40 tubercular female patients who have been living out of doors in tents erected on the grounds of the Asylum, and they are all improving. It has been proposed to establish a sanitarium of tents at this institution for treatment of all tubercular patients. A great many physicians think you can estimate the gravity of a case by the number of bacilli found in the expectoration. The number depends upon accidental circumstances, upon the focci which are softening and discharging at the time, and the fact that there are few bacilli in the sputum is a matter of as much importance from a diagnostic standpoint as a large number.

Dr John H. Lowman, Cleveland: It seems to me that a paper of this character demands more than a mere superficial consideration. It shows what is gradually becoming known that tuberculosis is easily curable, and the point taken by the essayist that the disease can be cured in the home has certainly been well brought out. That a case of tuberculosis can be cured in his own home by living out doors I have found to be true, and many physicians can duplicate cases of a similar nature to those which the speaker has mentioned in his paper. There is one thing which I think to be of great importance in the handling of the case is the personal element of the individual. Now every case which one treats in his own home does not get well, and it seems to me that not more than one-half of the cases in which we have attempted to follow out this out-door plan of treatment with the instructions as to food, rest, etc., have done well. Those patients in whom we have succeeded in getting some improvement are those who subject themselves easily to advice, and who are intelligent enough to follow out the plan of treatment, and who have the personal element of a successful patient in them. There are many patients who cannot comprehend this matter. It seems simple to say air, food, and rest, but to carry out the plan carefully and methodically is extremely difficult with some patients. Patients as a rule should be under constant observation, and herein lies the benefit of treatment in a sanitarium where the patient is under constant supervision, for in a half hour a patient may through carelessness or ignorance lose the benefit he has obtained from months of treatment. Take for instance the simple exercise of going down a hill

or coming up a hill. In doing the latter through the greater exertion required by a patient may cause a return of temperature. It is well known that in sanitaria they require him to take his first walk down hill and then afterward up hill and his temperature is taken after these walks. Sometimes after this exertion he will develop a temperature of 102° or 103° and then it will fall to normal in two or three weeks. If it does not fall to normal in two or three weeks it is not a favorable case as a rule. Usually you can get the patient out of his fever very soon, but it will require the personal observation of the physician and the constant care of the patient. If he walks a little too far, if he is a little careless about his diet, if he exposes himself to the wind too much, if he makes a little too great an effort at any time, his temperature will rise. He ought to follow his case constantly with a thermometer. That is the great argument in favor of sanitaria. If a patient can have his own physician and have a nurse, and then follow out all the directions the home treatment will be just as good. One other point, what shall we do with the patient at home when he becomes stationary—when he gets to a point where the rales have ceased and his temperature has come down, when he is taking a walk according to the regimè followed in sanitaria, but where he seems to be no further progress? Shall we leave him at home then? A patient who becomes stationary should be moved, perhaps to a little higher or a little lower altitude, he should be sent out into the country or have some-other diversion. I believe if it can be carried out in the most intelligent way with the constant care on the part of the individual the home treatment would probably be the best, but it is attended with a great many difficulties. Patients even in the third stage will improve under this home treatment. Last winter I saw a man with a cavity of the lung who I thought could not get well. He was put to bed and treatment instituted, and after a time his fever fell, he began gradually to improve and has so continued up to the present time. His ease is the most extraordinary one that I have ever seen.

I think this thing is under the control of every individual of this Association, we can follow out the plan of treating patients in the individual way and we can certainly get good results from it.

Now what are we going to do with the poor who are

afflicted with this disease? They will have to be treated in institutions, and along this line I would say that it is a most fortunate thing that there is some prospect of our having sanitaria established by the State of Ohio in which 100 patients can be treated at a time.

Dr S. S. Halderman, Portsmouth: Dr Sawyer has presented a subject about which we cannot talk too much, one that we should earnestly teach in our practice, especially to those of our consumptive patients who cannot avail themselves of the change of climate. The popular idea that there is an etiologic relationship between climate and consumption has given rise to an exaggerated idea of the value of climate in the treatment of the disease. The fact is, climate itself has no great therapeutic value in the treatment of tuberculosis. Home comforts, with a liberal supply of easily digested food, and an abundance of pure air, with patients of moderate means, is preferable to climatic treatment without home comforts. Ordinarily, persons suffering from pulmonary tuberculosis should not be advised to change climate, unless they can do so permanently.

Dr John P. Sawyer, Cleveland, closing discussion: The short paper which I have presented before you today was not intended to cover the whole treatment of tuberculosis, but to make clear what I felt was not widely accepted in the ranks of the general profession, that right here at home there are measures which can be instituted for improving the strength of individuals suffering with tuberculosis, for heightening their resistance to this disease and of increasing their power to recover. This thing, however, is repellent to most patients. Most people feel that it is something that is risky, a fad, a new idea, which will require a great deal of precision, to say nothing of persistent determination. In reality it does not require very much of an effort to keep it up.

I have been asked in what class of cases would this treatment be contraindicated, and I have answered in none. I should not care to take a moribund patient, but I have had patients with a temperature of over 103° with the developments of the third stage, with cavity formation and raising large quantities of pus, who have been put out in the open air, and given intratracheal injections in combination with other remedies, the hypophosphites, etc., and these

with other remedies, the hypophosphites, etc., and these patients have been benefited by these measures.

The question of elevation is a matter which I think to be not nearly so important as it would appear to be. Many of the patients whom I have treated have been on the second floor on porches, and many sleep on the ground floor in tents. Tents are being used more and more extensively in the treatment of this disease and the results that are being obtained in their use certainly speaks against the necessity of having the patient's bed above the ground floor. The effect of sunshine is most valuable. I was first struck with this some years ago when visiting the light institution of Finsen in Copenhagen. They were then first trying the effect of light on the treatment of anemias, lupus, etc., and on the summer days when the sun shone the brightest they were accomplishing much more for their patients than they did on other days, and they stated this fact.

I am strongly in favor of giving these patients all the sunshine and open air possible as suggested by Dr Kinsman. These cases are treated in this fashion in Norway with a temperature of 24° below zero and do well. It has been said that the Adirondacks with their mild degree of fog are not good for tubercular patients, but this is found not to be a contraindication, in fact some say foggy atmosphere is better because the moisture is partially condensed.

The question of diet is of the utmost importance. This should consist of those things which will increase their physiologic resistance, and if patients cannot be treated in a sanitarium where special attention is given to this phase of the treatment, then of course a plan of diet must be carried out at home. Milk and eggs are useful for some patients, but they are bad for others. To feed a patient properly is entirely a process of individualization, each patient being a law unto himself. To build up the whole economy so that it may be able to withstand the undermining influences of this disease should be our chief aim.

Some Observations on Climatic Changes in Respiratory Diseases

By T. N. B. Whiteleather, M. D., Malvern

In presenting this paper we do not feel sanguine of offering anything new to the medical profession of Ohio. If we can recall to our minds some thoughts that have already been elucidated by the many medical journals, now read by all practitioners, we shall consider our time well spent.

Statistics demonstrate to us that we are making but very little more progress in successfully combating these diseases than did our predecessors in the first half of the nineteenth century. The fact that respiratory diseases are the gateways by which so many lives pass out each year, has possibly much to do with bringing the subject to the front at present; they are, perhaps, too, more discussed by the profession and laity at the present time than any other diseases.

It is not my intention to take up all the respiratory diseases, for such a task would far exceed the limits of an ordinary paper. There are, however, a few aspects of the subject that should receive our attention and be fully discussed until some rational or at least general understanding is evolved by which we can more fully understand the relation existing between climate and its effects.

We would define climate as signifying that peculiar state of the atmosphere, as regard to heat and moisture, which prevails in any given place, together with meteorologic conditions generally, insofar as they exert an influence on animal and vegetable life.

Knowing that the chief elements of the air are oxygen, nitrogen, carbon-oxid, monoxid and ozone, and that oxygen was early recognized as its chief constituent, from time immemorial advantage has been taken of the purity and certain other unknown quantities of the air for the prevention of diseases. The character of the atmosphere is naturally reckoned as one of the most important elements of climate.

The dual relation existing between the elements of the air and of the body, and with the disturbance of either, accounts for some of the most familiar phenomena of respiratory diseases. When we take into consideration that the respiratory tract, consisting of minute anatomic structures and endowed with sensation so acute that the inhalation of air impregnated with an infinitesimal particle of peculiar odor (if an idiosyncrasy exists), will cause spasmodic contraction of the bronchi, producing a well-marked type of asthma, and as climate is a local term every community has its own climate modified by the physical environments, and the inhabitants of such community are living in a state of exposure to just the extent of the susceptibility of each and the sanitary conditions governing. Cases in illustration are as follows:

Case I: Mr W., with no pathologic lesion of the respiratory tract apparent, walks from his office to his residence. Passing along he breathes in unobservably the contaminated air from an adjoining brick plant. The carbon dioxid and monoxid act upon the sensitive epithelium, and produces a sudden attack of bronchial asthma. Passing further he enters into a zone of pure air which produces a sedative influence affecting normal respiration. What are the etiologic factors which warrant this condition to exist? Is it pathologic, psychologic or have we a dual influence?

Change the climatic conditions by removing the patient to a higher elevation, a healthy, dry atmosphere, and you observe your patient living in quietude.

Case II: These cases represent a change in environments and altitude. The father, son and daughter are aged respectively 42, 20, and 18. There is a tubercular family history on the maternal side. The mother died of tuberculosis; all have developed tuberculosis. Tubercular bacilli is present in each case; the environments of these patients are such as we meet with in an average home. Climatic conditions: There is an elevation of 600 feet, the atmosphere is changeable and the soil is sandy. The temperature, mean is 56°; maximum 90°; minimum, —20°. The patients were advised to change climate, but financial conditions forbid. Upon advise of physicians they purchased two tents

18 x 20 feet, and located on an elevation inclined to the southeast, surrounded by timber, good spring of running water (which is nature's friend in all diseases). Their general condition improved rapidly; they gained on an average of 15 pounds in three months, their strength improved, the cough lessened. The general bronchial trouble disappeared, no extension of consolidation, night sweats ceased, the appetite became normal, and sleep was undisturbed. The prognosis bids fair to complete recovery.

Knowing that a large percentage of respiratory diseases are benefited by a change of environments, by either local or distant climatic change, the question arises as to what are the elementary factors producing the desired result?

Experience teaches us that a large percentage of respiratory diseases are produced in the winter, spring and autumn months. We would naturally infer that sudden changes in weather would produce the result. Further observation teaches us that certain localities are disturbed more than others. What condition or modification produces this result? Can we associate climatic or meteorologic conditions with any of the phases of respiratory diseases so as to offer reasonable ground for belief that the relation, in any manner, is one of cause and effect? The answer would certainly be in the affirmative.

Were we able to positively ascertain the influence of meteorologic conditions upon the vital activity of the pathogenic bacteria, or were we able to ascertain to what extent climatic changes disturb the heat-producing powers of the human body, thereby disturbing the relation existing between the climatic and the autoclimatic resistance of the body, we could be more specific in choosing favorable locations for our patients with a certain knowledge of good or evil effects. In the absence of such knowledge, however, we must be governed by statistics showing the relative conditions of climate and prevailing respiratory diseases in each locality. Therefore, we have prepared a partial table with reference to the mean annual temperature, elevation, precipitation, cloudy, partly cloudy, clear, calm days and prevailing diseases in locality named.

	Normal Temperature			Elevation	Precipitation	Days				Prevailing Respiratory Diseases
	Maximum	Minimum	Mean			Cloudy	Partly Cloudy	Clear	Calm	
Cleveland	93	—4	50	740	36.68	164	112	89	0	Catarrh, Bronchitis, Pneumonia, Pleurisy, Pul. Tuberculosis.
Denver	96	—9	51.6	5309	11.84	58	181	111	15	Pneumonia, Pleurisy, Tuberculosis.
El Paso	103	14	64	3769	9.79	45	134	174	2	Resp. Diseases Minimum.
Los Angeles	103	35	63	330	11.8	37	146	142	40	Slight Catarrh, Resp. Diseases Minimum.
Sante Fe	89	7	50	6966	14.28	128	145	27	65	Resp. Dis. Minimum.
Phoenix	105	28	70	1106	10.48	52	85	119	9	Resp. Dis. Minimum.
Ashville	94	4	55.6	2220	38.39	76	120	166	3	Resp. Dis. Minimum.
Ft. Laramie	101	—20	48.3	5000	14.67	73	78	106	8	Pneumonia, Sporadic.
Jacksonville	100	24	69.6	100	40.19	66	137	161	1	Resp. Dis. Minimum.

Using the table as our guide, patients with profuse bronchial secretions, poor thoracic development, chronic pleurisy, fair to good circulation, high altitudes, such as Denver, El Paso, Santa Fe, Phoenix, gradually attained, would be beneficial. Patients with emphysema, bronchiactesis, poor circulation, acute febrile attacks, insomnia, extensive lesions, and elderly pneumonic patients, should derive benefit from climate represented by Ashville, Florida, Los Angeles. Too high an elevation lessens the amount of oxygen presented to the respiratory surface and the reduced atmospheric pressure diminishes the capacity of the blood to retain gases.

We learn by statistics that the prevailing respiratory diseases of the New England, Middle, and States carved out of the northwestern territory, are of a larger percentage than our sister States and Territories, with an advantage of higher elevation. The temperature is more equable, precipitation less, inverse ratio of cloudy and clear days. The sequence: The weather is more uniform than in higher latitudes, the changes of temperature from day to day are less, the sky is generally clear, insulation and radiation are both strong, winds generally light and evaporation high. High tem-

peratures are mitigated, to a certain degree, by the prevailing dryness of the atmosphere and the clearness of the sky, which promotes terrestrial radiation, an effectual means of lowering the temperature of night time. Comparing the number of cases of respiratory diseases between the western, middle and eastern States, the evidence is strongly in favor of the west. The small percentage of respiratory diseases in high altitudes should be conclusive evidence for the general advice by the profession to our patients who are in the incipient stages of phthisis pulmonalis or chronic bronchial affections, etc., and those susceptible to sudden changes to seek a more congenial clime. Through a lengthened period of communication for the last five years I have kept observation of 40 patients who in various stages of respiratory diseases have sought locations representing the various degrees of climate, from the boasted Californias, as described by one in his communication, if you will allow me to use his language, as follows: "I wish I could send you a bit of our climate in this letter, but there is so much of it, so much that it gets into one's bones, hunts out all the achy spots, oils the creaking machinery, digs the festive microbes out of the corners and pours in the sunshine in unlimited quantities, executes the pathogenic bacteria and fills you full of oxygen and ozone until one is forced to be well in self-defense." We can find the other extreme by using an extract from Mark Twain's speech on New England's climate. He says: "I reverently believe that the Maker who made us all makes everything in New England but the weather; I don't know who makes that. There is a sumptuous variety about New England's weather that compels the stranger's admiration—and regret." In the spring I have counted 136 different kinds of weather in 24 hours. I have observed that 12 sought relief in southern California; four returned with good health, three were quietly and solemnly returned; five are convalescing. Six patients breathe the pure air of Colorado; two are practically well, three are convalescing, and one died. Seven cast their lots in

the climate of New Mexico; two died, and five are convalescing. Two journeyed to Ashville; one died, and one is recovering. Two went to the Adirondacks of New York State; both are improving. Ten are satisfied with Ohio's climate; three died, six are convalescing, and one is apparently stationary.

After viewing the results, sober thought forces us to the following conclusion: that patients suffering with incipient tuberculosis, chronic pleurisy and asthmatics are benefited by a change of climate, provided they possess means sufficient to meet their varied wants; otherwise their native climate, with environments suitable, will prove more beneficial. After nearly two centuries of general knowledge of respiratory diseases, we believe that we are stating the general sentiment of the medical profession by saying that less drugs, pure air, 24 hours in a day, 365 days in year, constitute the treatment in the beginning of the twentieth century.

DISCUSSION

Dr John P. Sawyer, Cleveland: I think that this matter is of a good deal of importance. We certainly should take a little more thought in reference to the weather conditions than we have done with our patients. There is much more in the vasomotor influence upon bronchial diseases, even upon digestive diseases and upon blood conditions, than we are in the habit of thinking, and there is more of a physiologic influence brought to bear upon such processes as the Doctor indicates in his paper than we are wont to think is the case. The distribution of the blood in the skin has a very decided and powerful influence upon the distribution of the blood in the internal organs, and while these figures brought before us are difficult sometimes to follow clearly, yet the fact is that they express changing influences all the while brought to bear upon all of us. Some of us are much more susceptible to these influences than others. Under good physiologic conditions an individual is not easily disturbed, under poor physiologic conditions the same individual becomes profoundly affected by climatic changes. In conditions such as bronchitis, emphysematous conditions, tuberculous processes in the

lungs, etc., climatic changes have a great influence. I think the Doctor has done us good service in bringing to our attention the importance of this subject.

Dr H. C. Bliss, Cleveland: I think that climatic influences in the treatment of pulmonary tuberculosis and other lung affections figure very considerably. Five years ago I began to treat a young woman in whom a large part of the left lung and part of the right was tubercular. I induced her to camp out in the open air in the outskirts of Cleveland all summer.

She got along remarkably well. The diseased lung contracted, she gained in weight, the temperature went down, her pulse improved and she was better in every way and was married in the fall of the year. She did her own housework all winter, with the windows open freely.

I persuaded her to read up the subject carefully. The next summer she camped out again and also the following summer, but on June 22 of last year she was confined and was obliged to take care of her baby, which she did, in the open air as much as possible until the weather became unfit to be out doors with a baby. This last winter she was forced to stay in the house much of the time and went to pieces in the spring with hemorrhages. The baby also died of what was probably a tubercular diarrhea.

I do not believe that the so-called home treatment is, or ever can be, as successful where the climate is adverse, as it would be where there were more hours of sunshine and moderate temperature. I feel that this patient would have done better and lived longer in a more favorable climate.

Dr T. N. B. Whitcleather, Malvern, closing discussion: This question of climate and becoming acclimated is one with which we as physicians will have to contend. Respiratory diseases, while partially on the decrease at the present time, will evidently be among us always.

If we will go back and look up biblical history, we will find that there are quite a number of places mentioned as localities where they tried to acclimate patients. They tried to colonize certain localities, but after some years had elapsed they all died from the effects of the climate; in other words, they never became acclimated. Europe has tried to colonize the valley of the Nile and has failed on account of the severity of the hot climate on the children.

It is not only a question for the physicians of this State

to decide, but of every State in the Union, as to whether a person can be acclimated to a certain place so that he can be treated there, or to transport him to some other climate which proves to be more beneficial.

Will we make more progress by locating patients at a place where the climate is more suitable to them, or will we meet with better success in allowing them to remain at home, restricting the patients to open-air treatment?

The State sanitoria will certainly prove to be a blessing to the poor: but we should ever keep in mind the crowded condition of such institutions and the repugnance some patients experience in coming in contact with their fellow beings suffering with the dread diseases of the respiratory organs.

Diabetes Mellitus

With Especial Reference to Etiology

By George F. Zinninger, M. D., Canton

The syndrome of symptoms comprising the disease diabetes mellitus is such a striking clinical entity that we would expect unmistakable descriptions of the disease dating to the earliest medical writers and such we find to be the case, being found in the writings of the Ancient Indian Physicians, the Roman Celsus and Greek Areteus, the latter writing in the first century A. D. The priority of the discovery of sugar in the urine is due Thomas Willis, an English physician, the evidence resting upon the sweet taste of the urine, but it was M. Dobson in 1775 who isolated and identified it. The definite and certain beginnings in the study of the disease diabetes began with the "sugar puncture" of Claude Bernard in 1849, and since his celebrated work the literature has grown to enormous proportions.

Diabetes mellitus as you all well know is a disease involving carbohydrate metabolism, and no phase of the disease can be discussed without presenting the salient facts in connection therewith.

The chief source whereby we introduce sugar into the animal organism is by starchy food stuffs, and vegetable, grape, and fruit sugars. Starches being polysaccharids must be acted upon by a diastatic or hydrolytic ferment and reduced to di- or monosaccharids before being capable of absorption into the animal organism, and these ferments we find especially in the buccal and pancreatic juices, yet hardly absent in any part of the body.

Cane sugar being a disaccharid is by the action of either an acid or a ferment split into an invert sugar and absorbed as dextrose or levulose, while fruit and milk sugars are absorbed unchanged. The next inquiry which arises is: What is the fate of these various sugars? Following digestion and absorption the portal vein conveys them to the liver which by some unknown action converts them into glycogen, an insoluble flaky substance, and holds it for further use, and to such storage capacity the liver is capable that it may reach 14% of its own weight.

The muscles also store up glycogen, which always runs parallel with that of the liver, and in the aggregate about an equal amount, but differs in that during depletion clings to it more tenaciously, the liver being the organ to maintain the equal sugar percentage of the blood. While most or all tissues store glycogen yet the liver and muscles are the great storage reservoirs of this substance. The liver does not give up its glycogen as such, but by some unknown way, as it were, recoins it and puts it out as grape sugar, and it is from this source that the muscles elaborate their glycogen and get their supply for oxidation.

The carbohydrates are, however, not the only source of grape sugar, for the study of diabetes in man and experimentally in animals has shown that carbohydrates are formed from the albuminous molecule, and in this connection Minkowski has shown that a least 45 grams of carbohydrate have been formed out of 100 grains of albumin.

At this juncture we may ask what occurs if the carbohydrates are ingested in insufficient amounts to maintain

the necessary sugar percentage of the blood? We know that the blood must have a sufficient percentage. We have two sources upon which to draw, *viz.*, the albuminous or fat molecule; and it has been shown that both are capable to be drawn upon for utilization, and further also that normally the albuminous if so converted leaves but little doubt; but the fat is, so to speak, faculative and only drawn upon during an insufficient supply.

Secondly, we may ask what happens if carbohydrates are ingested in excess.

The body of man can warehouse from 200 to 300 grams of glucose taken at once and if this amount is exceeded either alimentary glycosuria occurs or fat is deposited. The sugar content of the blood can vary within but very narrow bounds, for if less than .1% exists it draws strongly upon the glycogen reservoirs and if more than .15% or .2% exists glycosuria follows. Such is in brief outline the skeleton of established facts of carbohydrate metabolism.

Experimental Glycosuria: In 1849 Claude Bernard showed that by puncturing the calamus scriptorius of the fourth ventricle *(piqûre, Zucker Stich)* there invariably results a glycosuria, which, however, is transient, lasting but for several hours, and following this the liver is depleted of its glycogen so as to be free or containing only a trace; and it has been still furthermore shown that if you deprive the liver of its glycogen by starving and exercise, no glycosuria follows such puncture. Hence, we are forced to the conclusion that this center presides over the liver's glycogenetic function, causing it to discharge its glycogen, hyperglycemia resulting and in turn glycosuria.

We may ask if this is diabetes? Does it correspond to any clinical type of the disease? We must answer, no. Does this storage insufficiently play any rôle in diabetes? We do not know, but probably it does in certain types of the disease.

Administration of Drugs: Glycosuria has followed the administration of quite a variety of drugs but notably that of phloridzin, a glucoside obtained from roots of the apple

the blood, and offered experimental evidence in support of his theory, which, however, could not be substantiated by many competent subsequent workers who repeated his experiments. However, this was the stimulus and the germ around which subsequent workers have builded and are continuing to build a very plausible working hypothesis of the pathology of diabetes, as we shall presently show.

That *total* destruction of the pancreas is invariably followed by fatal diabetes is an established fact postmortem in man and experimentally in animals and those cases occurring formerly in which the pancreas were supposed to be entirely destroyed and no diabetes existing, later histologic investigations have shown that though the secreting parenchyma is completely destroyed, the islands of Langerhans were yet intact and have resisted the invading pathologic process.

In the pancreas of all animals, especially in the tail of same, are to be found cell group structures designated the interacinar islands or islands of Langerhans, who first described them in 1869. They consist of epithelial cell groups and are developed, as embryologic studies have shown, simultaneously with the secreting parenchymatous cells, but in the course of development become differentiated and cut off from the intraacinar ducts. The cells composing the same, which are smaller than the cells of the secreting parenchyma, being usually round or polygonal, have a round dense nucleus and quite clear homogeneous cytoplasm. Between these cells, which are arranged in more or less columnar manner, are to be found large, wide and freely anastamosing capillaries, which, however, do not spring from arteries exclusively distributed to these structures.

Opie in his recent and brilliant researches, researches which have commanded world-wide respect and attention and have convinced foreign workers of the virility of the research spirit now dominating American medical thought, has emphasized the dual anatomic and functional character of the gland. He cogently reasons and asks why have the

interacinar islands, which have no connection with the secreting intraacinar ducts, such large capillaries, and in such intimate proximity to the cells, if they have no function in relation to the elaboration of an internal secretion? Does not their histologic structures suggest their function?

In support of his contention he has shown that diabetes of the pancreatic type is correlated not with the loss of function of the secreting parenchyma, but with the interacinar islands. Obviously, but unfortunately, these islands cannot be subjected to direct experiment, but deductions drawn from the experiments nature performs by the selective action in certain pathologic processes enables us with certainty to conclude that these interacinar islands control sugar metabolism and whose loss of function produces a fatal type of diabetes mellitus.

Opie and others have shown that in the evolution of interstitial pancreatitis, diabetes does not result even though the parenchymatons secreting elements are destroyed so long as the islands of Langerhans are yet intact within the sclerosed area, but so soon as these islands are seriously involved by the sclerosing process and *pari passu* with their destruction diabetes of increasing severity supervenes.

In another pathologic process selective in its action, but quite the reverse in the elements of the gland involved, again quoting from the work of Opie who has shown that the islands were extensively involved in six out of 19 cases of diabetes, studied by this author while the secreting parenchyma was but slightly altered, he says that in three cases the islands were the seat of extensive hyalin degeneration while in three the lesion simulated a coagulative necrosis. These observations of Opie have since been noted by other American observers, but the most noteworthy corroboration comes from the pathologic laboratory of Weichselbaum, whose wealth of material enables himself and Strangl, who report 33 cases, to conclude that these islands play a predominant role in the transformation of the carbohydrates in the organism, and that the other

alterations found seem to be the consequences of the diabetes rather than factors in its production.

From the anatomic evidence at hand, following a sufficient number of cases examined histopathologically, we may safely conclude that it is not the secreting parenchyma of the pancreas that is concerned in sugar metabolism, but that that function is correlated with that of the interacinar islands, but whether these islands furnish an internal secretion producing the oxidation of sugar or destroys some body concerned therewith, or in what manner they act, is yet an unsolved problem.

In the light of all the evidence, both experimental and pathologic, we are certain that the complete destruction of the pancreas, or alone of the islands of Langerhans, there is produced a severe and fatal diabetes and that considerably more than 50% of all cases have this etiology; but what of the other 40% that shows no pancreatic change?

That other organs are concerned and influence sugar metabolism cannot be doubted, but we believe that improved methods and more careful histologic examination will yet show a greater percentage having a pancreatic origin.

A great many diverse experimental and clinical facts are known and cluster about the disease, but they really are but fragmentary and at present incapable of being correlated and interpreted as offering any logic explanation as etiologic of diabetes. For example, Herter has shown that if you paint the pancreas with a suprarenal extract sugar will at once appear in the urine; also in connection with the hypothetic ferment furnished by the interacinar islands, Conheim has recently shown that if you add an extract prepared from fresh pancreatic gland to a solution of sugar, no oxidation takes place, but if a similar extract prepared from muscle is added active glycolysis at once takes place and he therefore argues that the glycolyctic ferment furnished by the pancreas is inert until sensetized, so to speak, by a body derived from the muscle, a process analogous, as Pawlow has shown that the proteoloytic ferment derived from the secret-

ing parenchyma is inert until rendered active by the enterkinase secreted by the intestinal epithelium. Osler suggests, even though the islands show no histopathologic change microscopically, they may not be functionally active, producing no ferment. So who can say when light has once dawned and the last word has been said how many of these cases are in reality pancreatic in origin? To explain the alleged hereditary predisposition to diabetes, Opie suggests that it may be due to congenital smallness or fewness of interacinar islands, and offers evidence in support therefor.

The association of diabetes as a terminal event in other diseases, such as hepatic cirrhosis, hemochromatosis, acromegaly, arteriosclerosis is rationally and plausibly explained by the associated pancreatic changes occurring in these affections. The occurrence of glycosuria and diabetes associated with lesions of the central nervous system and even peripheral nerve-trunks, of ductless glands, in exophthalmic goiter, after the administration of toxic substances, etc., show the complexity of carboydrate metabolism in the animal body.

Conclusions: Experimentally in animals glycosuria can be produced in a great variey of ways, *viz.*, injuries to the central or peripheral nervous system, to the sympathetic system, and by the administration of various poisons. These are transient states soon to disappear. True diabetes mellitus can be produced experimentally and invariably by complete destruction of the pancreas. The specific constituent of the pancreas which controls carbohydrate metabolism is not the secreting parenchyma, but the groups of cells known as the interacinar or islands of Langerhans, which are independent of the secreting parenchyma, having no connection with the excretory ducts.

Fifty to 60% of all cases of diabetes show destruction or marked changes in the interacinar islands accompanying especially interacinar pancreatis, hepatic cirrhosis, hemachromatosis; also especially prone are these islands to hyalin degeneration often unaccompanied by any marked changes in the secreting parenchyma. For the remainder of cases of diabetes, those which show no pancreatic change, we are at present unable to offer any adequate explanation of their etiology.

Natural and Artificial Immunity

By J. Robert Caywood, M. D., Piqua

It is not the purpose in this short paper to discuss the many theories of immunity, however interesting and instructive is the study of this branch of our profession.

There are a great many questions concerning the phenomena of immunity which have always been surrounded with a dark cloud of mystery, but since Ehrlich, in 1897, published in a German medical journal his theory of immunity, great progress has been made in the solution of the problem.

The hypothesis upon which the theory of evolution has gained so prominent a position in the annals of scientific investigation, while it may remain forever without the absolute proof which its most ardent followers could desire, it nevertheless has formed the working basis of much truthful information of inestimable value. The future possibilities of more practical application and value to humanity are wrapped up in the more recent theories of immunity which have been received with almost universal favor and been adopted as a working basis in many branches of physiologic chemistry.

Metchnikoff has so modified his original theory to new discoveries and has adopted these observations to harmonize with his doctrine. With an unconscious spirit of devotion to truth, he has, with much facility, abandoned his purely biologic and mechanical explanation as the original theory embodied.

For the solution of this great problem of immunity we have light emanating from two master minds. Metchnikoff, a zoologist and profound thinker of untiring energy, gave to us the theory of phagocytosis, based upon the fundamental principles of cellular biology, by which he explains immunity. Prof. Ehrlich, a physiologic chemist, had his vision of the side-chain theory while he was experimenting with diphtheria antitoxin, trying to make standard and concentrated serums.

It seems to us most reasonable that from an absolute knowledge of microscopic anatomy and physiology, that the theory of phagocytosis and cell activity is of prime importance and is the factor which makes the first equation in the solution of the problem.

The activity of leukocytes is certainly of much importance in defending the body against invasions by foreign substances, and is the first step in the process of immunization. The body juices destroy many forms of bacteria by their germicidal properties, which is another step in the great battle of protection. Metchnikoff devised the theory of phagocytosis by which he and his followers endeavored to explain how the leukocytes of the body attacked all invading forms to normal metabolism by injesting, destroying and carrying out of the system any and all foreign substances, or pathologic microparasites.

Immunity may be called one of the decisive battles of physical life. Throughout the progress of this war between health and disease, the blood-corpuscles and phagocytes may be compared to the great naval forces of our country; they float about in the juices of the body and do service in the blood and lymphatic system. The cells of the various organs of the body form the great divisions of land forces. The commander of all the forces which do battle for the maintenance of health, may be called "specific chemical affinity." Arrayed upon either side in every conflict are powerful forces with varied and ingenious appliances for defense and destruction. Just what these appliances are and how they are manipulated during times of health and in emergencies to protect against disease, is as yet largely theoretic, but the one theory which explains better than any yet suggested is based upon mechanism by which cells are nourished, and the specific action of certain toxin bodies upon the cells of the body.

In much of the recent literature upon scientific medicine, many references are made to the "lateral chain" theory

of immunity. The following summary will serve to explain the technical working of Ehrlich's theory:

Each cell is a mechanism composed of complex molecular groups whose combinations are able, under all morphologic conditions, to maintain the characteristics of an organized body, assuming that each cell is a complex organism, the protoplasm having many combining affinities which are represented as lateral chains. Attached to each cell are certain complex atom groups called receptors whose function it is to appropriate certain substances necessary for the nutrition of the cell. According to a peculiar special affinity which these receptors possess, each cell is provided with its nutrition. These receptors appropriate only such proteid molecular bodies called haptophores which are fitted, through their composition, for combining with certain receptors. Any receptor may become the point of attachment for many different haptophores which are morphologically capable of combination, but each haptophore can attach itself to but one kind of receptor.

In health, circulating in the juices of the body, are certain proteid substances which are appropriate for attachment to their receptors to maintain normal functional activity of the cells. When, by accident, or by some pathologic process, any foreign proteid bodies with poisonous or destructive haptophore find their way into the juice of the body; these may become attached to appropriate receptors. As the cells composing the different organs of the body have different functions, so they are provided with different kinds of receptors for their nutrition. Now, not all the foreign substances combine with all or any cells of the body, but with only such cells as have appropriate receptors for the foreign haptophores, and it is this peculiar characteristic which constitutes the so-called specific affinity. In the event of foreign haptophores combining with receptors of normal cells, there is diversion or destruction of normal nutrition of that cell, provided that the cell does not exert itself to form sufficient new receptors to satisfy or neutralize this foreign haptophore and still maintain normal function.

Foreign haptophores combining with receptors of normal cells may so completely use their receptors as to destroy the nutrition and function of the cell and diffuse through its substance such poison which will destroy it. Through repeated attacks by foreign and poisonous haptophorous molecules, the cell experiences the necessity for increased nourishment and proceeds to form for itself receptors greatly in excess of normal needs, which may be liberated and float out into surrounding juices, where they possess exactly the same affinities to unite with appropriate haptophores, and thus uniting from toxoids bodies, which are harmless, very unstable, and are at once carried out of the body by the different emunctories.

Not all of the phenomena of immunity can be explained by this simple, direct combination of cell constituent substance with foreign and poisonous bodies. However, this is the principle and foundation of the whole theory.

In consideration of the next step, we find that the lysins and cytotoxines act through some intermediate body, called by different writers amboceptors, immune body, or fixature, also normally present in the body juices is a complementary body or alexin, which is the real solvent when amboceptors and the lysin combine with the cell. The amboceptor attaches itself on the one hand to the receptor of the cell to be destroyed and on the other through the complement.

Predisposition is another equation to be dealt with in the problem of immunity. There is in certain individuals an increased liability to an attack of certain diseases. The existence of this tendency has long been known and recognized by physicians generally, but the explanations have been unsatisfactory and always clouded with an air of mystery. We recognize in certain individuals a peculiar physiognomy by which we characterize them as being of a phlegmatic disposition. Another person has always a bright cheery countenance, fair transparent complexion, large bright eyes, in whom the mental and physical energies are very active;

again another person has narrow, contracted chest walls, irregular features, anemic and sallow complexion, a rather inquiring, hopeful expression, and we recognize tubercular diathesis. With these certain anatomic features we are lead to believe they each produce certain physiologic results; but diathesis is not diagnosis, and peculiar disposition is not reason for results.

Ehrlich's theory will brighten up the way for an explanation, for we have only to suppose that in the person of tubercular tendency there is a lack of those mediators especially capable of dealing with the germs of that disease, and when infection takes place, the results are rapidly destructive to the organism.

"The experiments of Ehrlich, Shattock and Grumbaum show that there are individual differences in the human blood. They found that the serum of Mr A. when injected into Mr B. would hemolyze B's xanthrocytes, but not C's or D's, while it would act on E's. Also Bullock has shown that hemolysis may be transmitted from mother to child, and if an existing property may be so transmitted, it is even more likely to be absent. Hence, it is only natural that predisposition is likely to be hereditary and the unfortunate effects are only to be combated by improvement of environment and the production of the deficient mediators."

Predisposition may be acquired, when it shades off into a condition simulating susceptibility. When the system has a diminished amount of receptors floating in the juice of the body or a scarcity for even the nutrition of its cells, or an insufficient supply of complementary substance, in this unprotected condition an attack by any toxic group is often of great loss to the system in fortification and defense; so we often say without thinking why, that malnutrition predisposes, or a poorly or improperly nourished patient is more susceptible to infection. Certain acquired habits predispose toward disease. It has been shown by Abbott's experiments that the prolonged administration of alcohol to test animals diminishes the serum complement of the blood and renders

the animal more susceptible to infection by pathogenic organisms.

Another recognized form of acquired susceptibility which we observe almost daily is that after an attack of acute rhinitis and inflammation of upper air passages, or malaria fever, or tonsillitis, the patient is more liable to a second attack. In these instances the organism has acquired very little antitoxic power over the infecting agent. Stimulation to overproduction of protecting receptors has been ineffectual. There has been diminution of the normal amount of serum complement which has not been replaced naturally, or by the treatment administered.

In regard to those diseases in which an attack confers lasting immunity, as in smallpox, scarlet fever, measles, it is a remarkable fact that this class of diseases is most contagious and infectious. This is an attractive field for investigation, for there seems to be a deep, narrow chasm in our knowledge regarding those diseases in which one attack produces immunity and those which even seem to predispose to a second attack. I believe that the discovery of the cause of these infections and contagious diseases will soon lead to the application of an immunizing treatment, and the correct application of an antitoxin, will be the key which will unlock the mysteries wrapped up in this theory of immunity.

The application of a knowledge of immunity to the treatment and prevention of disease will be effectual only when we have thoroughly mastered the complex workings of the phenomenon which is based upon the fundamental principle which I have tried to outline today. Much of the successful treatment of disease in the future will be by preventive inoculation and by antitoxins. We have already a successful antitoxin for diphtheria and tetanus, and for smallpox a preventive inoculation. For many other diseases it will be necessary to produce in an animal by inoculation certain specific immune bodies, amboceptors, which, when transferred by its serum and introduced into the animal or man to be cured or protected, will contain the complement or will find the complement by which reaction to toxin may be accomplished.

Some Unusual Manifestations of Influenza

By Charles H. Hemmes, A. M., M. D., Sidney

An experience with the unusual is not an unusual experience during the prevalence of an epidemic of influenza, a disease usually lightly spoken of by the laity and frequently dismissed as trifling by the physician; yet

> Grip "is a monster of such frightful mien
> That to be hated needs but to be seen."
> And coming once within its baneful sway
> Forever after one will curse the day.

Influenza may be regarded as the king of mucous-membrane diseases. Many have succumbed to its majestic power who would have dismissed their physician had he given it the plebeian name of grip. It neither respects the dignity of the great nor besmirches to share the squalor of the lowly. For the strong it has no mercy; the weak it tramples upon with contempt. The gray-haired patriarch has felt the insult of its unwelcome presence; the fetus in utero has absorbed the poison of its exhalations.

Our earlier experience with influenza was with a disease that conformed to a certain group of typical symptoms—a disease that bore its brand upon its flanks, as it galloped across our country, so plain that our patients felt its burning presence and had made the proper diagnosis before calling a physician. The text-books parrot-like, took up and copied a few of the more prominent symptoms and wrote us a picture which was true enough to life in '89, but which does not show all the features of the twentieth century variety.

Were I to dwell but briefly with the various manifestations of this multiform disease as it attacks first the mucous membranes of the head, then the gastro-intestinal tract, and lastly the nervous system, my paper would reach beyond the limits of time allowed and impose upon the patience of my hearers. Consequently, I will mention but briefly a few

unusual manifestations occurring mostly below the level of the diaphragm.

In genitourinary practice one frequently meets with a supposed gonorrheal urethritis that under simple treatment subsides in a few days, and the suspicion is aroused that perhaps the physician was hasty in telling his patient that he did not believe his story of nonexposure. Not all urethritis, by any means, is gonorrheal, and that influenza sometimes manifests itself principally along the urinary canal has been demonstrated by a large number of cases in my experience within the past two years. These cases appeared mostly among men and women past the meridian of life, whose chastity was unquestioned, and in which the diagnosis was confirmed by the concomitant symptoms of influenza. We have frequently met with a herpetic eruption on the external genitalia of both male and female, resembling remotely the mucous patches of syphilis, but in persons possessing features characteristic of influenza in other parts of the body. This eruption heals rather slowly, and, to confuse one with syphilis, is usually accompanied by enlarged lymphatics also. Consequently, the differentiation from syphilis becomes a matter to be cautiously dealt with. The lesion is not so deep as the syphilitic mucous patch, and, of course, not accompanied by the history of an initial lesion or the exanthemata characteristic of syphilis; still the fact must not be lost sight of that influenza has its cutaneous eruptions also from a simple erythema to an exfoliative dermatitis. This herpetic condition will be frequently observed in children, especially those affected with the gastroenteric form, where there are superficial ulcerations along the colon and the stools are specked with blood stains and filled with mucus.

Cystitis, especially in the female, is frequently a companion of this herpetic condition in influenza. Of all the unpleasant manifestations of that disease it is one of the most annoying. It may be due to primary infection of the mucous membrane, of the bladder by the bacilli in the urine, or a migration of the disease from the external genitals, or

to irritation caused by the intensely acid urine. At any rate, it does not respond readily to either direct or indirect local treatment, either by bladder lavage or by the exhibition per os of salol or other drugs supposed to render the urine antiseptic. There is usually considerable swelling of the mucous membrane and sometimes of the prostate gland in the male, resulting in a temporary retention of urine. Retention is the rule in subjects of a previous gonorrheal stricture or in men who are beginning to feel the effects of senile prostatic hypertrophy. The pregnant woman, especially prone to vesical irritability, is frequently the victim of influenzic cystitis.

The enterprising drug manufacturers have attempted to find a cause for this cystitis, and the gastroenteric complications of influenza also, in that carelessly-used and much-abused uric-acid idea. That uric acid has sins enough to answer for that are sure-enough sins is doubtless true, and it does not seem just to make it the pack-horse, when, at least in the present instance, it is the cart—a *post hoc,* but not necessarily a *propter hoc.* The presence of large amounts of urates in the urine is due to digestive disturbances caused by the accompanying catarrhal state of the stomach and intestines. This excessive secretion of urates occurs for the most part after the acute fibrile symptoms have begun to disappear.

The atonic condition of the muscles governing the function of urination is a potent factor that must be taken into consideration in the discussion of this question of the influence of influenza upon the bladder. The same might be said of any other organs which depend in the performance of their physiologic function upon the activity of the involuntary muscular tissue which they contain; notably so are the heart, intestines and the uterus. There is probably no degenerative process going on in the muscles themselves, or at least none that can be determined by gross clinical obervation, but that there is a pathologic entity accountable for this muscular

atony, other then mere toxicohemia, is a conclusion that at least may be reckoned as a probability.

Lymphatic enlargement has been alluded to briefly. It is so common as not to be considered unusual, and it is well known that these glands have a tendency to take on tubercular infection wherever located. This is as true of the peritoneal lymphatics as elsewhere. These cases may go on to a fatal termination without evidence of tuberculosis elsewhere in the body. The enlarged glands in the mesentery can be easily palpated. The patient does not have diarrhea, as in tubercular peritonitis, except for a few days in the beginning of the disease, but there is obstipation. There is no effusion in the abdomen. In two cases in which I had the privilege of holding postmortem examinations there was obstinate constipation for four or five weeks, caused by a narrowing of the lumen of the intestine due to cicatricial contraction, and finally death from exhaustion, but no evidence of tuberculosis elsewhere in the body. Cough and expectoration were notably absent. Unfortunately the microscope was not brought into requisition at any time, and though there is a bare possibility that tuberculosis was present from the start, my individual opinion that tuberculosis was a secondary infection was concurred in by competent physicians who saw the cases.

The germ of influenza is said to enter the system through the respiratory mucous membrane, but that it enters through the respiratory tract alone can probably be successfully contradicted; that it enters fully as frequently through the mucous membrane of the digestive tract is borne out by the fact that frequently, and especially so in some epidemics, the respiratory system escapes completely, while the digestive system is completely overthrown by the onslaughts of the disease. In such cases the prostration is usually great and lasting, the result of nutritional disturbance. The muscular system is first poisoned and then starved. The assimilative and metabolic activity of the cells has been interfered with, so that food fails to nourish the body, and for a long time,

even after the appetite has returned, the muscular depression continues.

Hence in a purely muscular organ like the heart, to speak of which you will please pardon a slight digression from the original intention of limiting this paper to the organs below the diaphragm, we would expect effects of a most serious nature. As a fact, this disease has long been considered a serious menace to the heart. It sometimes takes months for the heart to recover its normal condition after an attack of influenza; often enough it never recovers. Influenzic cardiopathies are frequently attributed to the condition of the stomach and intestines, and are regarded as purely reflex or nervous phenomena, or, if there is valvular defect or a murmur present, to an imagined attack of rheumatism at some previous time. It is a fact that nine-tenths of the people, if asked if they ever had rheumatism, will answer in the affirmative. Many of these cases of heart trouble cannot be traced to a stereotyped cause, but date their origin with an attack of influenza. The heart muscle, poisoned by the toxins of this disease, starved by the defects in the digestive mechanism, fails to respond to its normal stimuli, and returns to work in a natural manner only after prolonged effort. Valvular defects, while uncommon, are not unknown results. Sudden death has occurred where there was no antimortem evidence of heart disease, in families in which influenza prevailed. This has occurred but twice in my experience, and may have been due to acetanilid, the principal ingredient of store "grip tablets"; but I could secure no evidence on which to base such a conclusion. It would be well, however, to unqualifiedly condemn acetanilid in the treatment of influenza.

Leaving the heart, let us return to the pelvis. Here we find another muscular organ, which occasionally has a physiologic function to perform that is as independent of the will as is the function of the heart. There is little literature to confirm the statement that the uterus is frequently the organ upon which this hydra-headed monster of a disease

expends its greatest force. We would infer from what has been said regarding its effects upon muscular tissue, however, that an organ which is so well supplied with muscular tissue as the uterus would be markedly affected. That this is true is proved by a series of cases in which the toxicity of the maternal blood not only proved fatal to the fetus in utero, but set up contractions that expelled it. If the fetus was not expelled at the height of the disease, we were met with a tedious labor at or before term, with a dead fetus or an inertion of the uterus and an instrumental delivery of a diminutive, unhealthy child and a tendency to postpartum complications, especially hemorrhage and subinvolution. In the epidemic of '02-'03 the abdominal type prevailed. Many cases, in which the invasion was gradual and accompanied by low fever and diarrhea, were mistaken for typhoid fever; while, on the other hand, a sudden invasion, with intense abdominal pain, nausea, and little if any diarrhea, was mistaken for appendicitis. In fact, catarrhal appendicitis was probably present, or came on as a sequel, and constitutes the variety of appendicitis that gets well, and frequently stays well, without the intervention of surgery.

The pregnant woman is not so susceptible to influenza, ordinarily, as her sister; but in this epidemic she came in for her full share.

Mrs E. suffered a typical attack of influenza in the latter part of December. Being unable to attend her, a neighboring physician was called. Two weeks later a three-month fetus came away. Inertia was so marked that the placenta lay loose in the uterus without being expelled though dilatation was sufficient for it to have escaped. Hemorrhage was controled only by tight packing.

Mrs D. had a moderate attack of influenza at the same time as the above case. An identical result followed. This also occurred during her third month of pregnancy.

Mrs H. a week later called me when passing her house. She was six months advanced in pregnancy and was undergoing an attack of influenza. Three weeks later she was delivered of a fetus that had been dead probably three weeks.

This fetus was alive at the time of the first visit. There was marked *inertio uteri* in this case also.

Mrs S. on the same day called me to check a uterine hemorrhage. No fetus was discovered, but a two-month placenta was removed by the finger. This woman a fortnight previously had a mild attack of influenza, and her amenorrhea was attributed to her having "taken cold," rather than to its real cause.

Mrs J. engaged me to attend her in confinement, the estimated time due being April 15. A few days before this she had an attack of influenza. There were no uterine contractions and no evidence of approaching labor. Two months later she was delivered of a long-since dead child, fully developed, which bore evidence of having been dead ever since the attack of influenza.

Mrs H. M. missed her courses in January. A month later she had a severe attack of influenza, and a couple of weeks later aborted.

Mrs F. B. expected to be confined in August. She had an attack of influenza in April. In June she was delivered of a decomposed fetus of about five months' gestation.

Mrs D. missed her menses in December. In the latter part of January she had an attack of influenza with bronchitis, persisting until the latter part of February, when in a fit of coughing the uterus was emptied of a two-month fetus with membranes intact. There was no hemorrhage, and structures had the appearance of having been detached from the uterine walls for some time.

This list could be supplemented by several cases in which there was an undoubted history of influenza preceding the miscarriage, but in which no physician was called. It can be further supplemented by a few cases in which the fetus was not killed by the disease; but what should, under ordinary conditions, have been a normal confinement was converted into a prolonged inactive labor, and the use of instruments was demanded for the delivery of a small child with a normal presentation, through a normal pelvis, something never called for if the uterus will contract satisfactorily. Indeed, I have been astounded at the large proportion of cases necessitating instrumental help where

previous labors had been natural in families in which influenza was prevalent.

The tendency of these women to postpartum troubles will not be marveled at. With a failure of the uterus to properly contract and empty itself, there is a retention of clots, and a favorable location for the lodgement of bacteria is thus made. Sepsis easily attacks such cases, and in their debilitated condition will not limit itself to the uterus, but extends to the peritoneum. The frequent trauma produced by the use of instruments, and the increased danger of carrying infection to the uterus, are matters to be carefully considered.

DISCUSSION

Dr D. W. Shumaker, New Bedford: I should like to ask the plan of treatment pursued in these cases of miscarriage. I myself have had a few experiences along that line. With the usual custom I prescribed quinin, although I got evidences to show that quinin is contraindicated in grip, yet I sometimes prescribed it in cases in which I thought there was no danger, and perhaps the next day in cases of pregnant women I would find an impending miscarriage. Since stopping the use of quinin I have not had the misfortune of having any further trouble along that line. Referring to influenza occurring in the lower part of the abdomen calls to mind a case coming under my notice several weeks ago which was diagnosed as grip and afterwards treated as typhoid fever. The case recovered under that treatment.

Dr R. H. Grube, Grape Grove: I want to come to the defense of a very good friend which has just been very much maligned, and that is acetanilid. To my mind it is the only specific which we have for influenza, especially in the beginning stages during the rigidity of the muscles and when pain is a prominent symptom. It is one of the coal-tar products which I have used for 10 years, and I must say that I have never had an unfavorable result from the use of acetanilid. I have been watching the literature on this subject and the objections made to its use are no more conclusive to me than the objections made to chloroform in labor because now and then a woman dies

who has been given chloroform during labor, whose death is not the result of the giving of the chloroform at all. The same thing applies to antitoxin. I have known of patients suffering with diphtheria who have died when the Doctor was preparing the syringe to make the injection of antitoxin. If these same patients had died a few moments after the antitoxin had been given the death would immediately have been charged to the antitoxin when it was in reality due to heart failure. People also died from heart failure who have never taken acetanilid. In 10 years almost constant use of this drug I have never had one bad result from it, not even a cyanosis, although once in a while this may occur, but it is easily relieved.

Dr J. H. Lower, Piqua: In regard to the influence on the heart, there can be no question but that the Doctor's conclusions are correct. In regard to abortions and miscarriages I have had the same experience along that line, and sometimes have almost an epidemic of abortions without any influenza. To draw the direct conclusion that influenza is producing these is unjustifiable. Sometimes it might be the cause, but I cannot agree with the Doctor in the broad inference he has made in regard to influenza being the cause of abortions, etc. In regard to the entrance of the germ into the body through the digestive tract my opinion is that the bacilli of influenza as a rule enter the blood through the respiratory tract, and when they once enter their work is begun.

Dr Chas. H. Higgins, Sonora, closing discussion: In regard to the treatment of influenza, I would say that it is a disease which has so many manifestations that to outline a plan of treatment would be to give all the symptoms in the category of disease with their appropriate remedies. It has never been my custom to treat a disease, but the patient. As to the use of quinin in the treatment of these cases, I have made very small use of this drug, as quinin is an antiperiodic. It is not indicated in the treatment of influenza to any extent. I have used acetanilid very little, in the last five years have used it hardly at all, and never in influenza because of the prostration which we have in the disease. It is a disease which is marked by prostration. That is the principal characteristic of the disease, and when we are called in to see a patient suffering with this disease, in a prostrated condition, it seems unscientific to me to

give a drug of this kind. In treating these cases I have made use of the ordinary sedatives and intestinal antiseptics, salol for instance, to a great extent. Sometimes the fluid extract of black cohosh, tincture of bryonia, gelsemium, etc. These drugs can be given for the muscular pains, but each case will suggest its own treatment.

Migraine

By D. N. Kinsman, M. D., Columbus

Case: Physician, age 70, not alcoholic, rheumatic or luetic, has had some gouty symptoms in his feet, and, occasionally at long intervals, uric acid crystals in the urine. He has suffered from migraine 60 years. The disease is hereditary in his family for five generations. The transmission, with one exception, has been by the mother. In youth the attacks occurred every week, but later came on every two weeks. Since the age of 50 they have been much less frequent, coming every six or eight weeks. His mother had migraine until the climacteric. She now is living at the age of 93. Her brother, who did at the age of 83, suffered with these attacks until death. The patient's sisters were relieved of their headaches when they ceased menstruating. A curious fact in the patient's family of brothers and sisters may be noted. Those who had blue eyes and sandy hair like the father had no headaches, while those with black eyes and hair like the mother, all had migraine. In early life the pain was mostly located in ophthalmic branch of the fifth cranial nerve. During later years the pain has been in the occipital region, possibly due to pain in that branch of the fifth nerve which supplies the tentorium. I do not think the pneumogastric can be implicated because there is no nausea. The root and tip of the nose, which are supplied by a branch of the ophthalmic division, are never the seat of pain. When there is pain in these points we never associate it with migraine.

The pain of migraine is as different from that of supraorbital neuralgia as that caused by the dentist's burr in a sensitive tooth is from toothache.

The attack is ushered in by a stage of disordered sensation. The patient wakes in the morning weary and irritable,

all noises disturb him, slight sounds make him jump. His vision is hazy, and sometimes there is an excessive flow of saliva. He has ringing in the ears. Fortification lines and scintillating scotomata appear at times like a bilateral hemianopsia in the segments of the eyes. There may be double vision, pupils are sometimes dilated, anesthesia of one-half of the tongue and lips has been experienced.

Once while sitting in my office the patient (who is the writer) reading an evening paper suddenly observed that he could no longer take in the sense of what he was reading. I could see the written words, but when they passed from the visual field I could no longer remember what I had read. I could neither recall the words in the sentence nor their purport. Although I could observe my own mental status, my relation to the printed page had in some way been suddenly dislocated. A friend called to see me at this time and I found I had the same confusion in trying to remember what he had said when he had finished a sentence. He observed a disturbance in my speech and I was alarmed at my condition. I excused myself and went to bed to await developments. There were no motor disorders. In a half hour or so my head began to ache. I picked up the paper and found my old relations to the printed page had been resumed, and for the first time in my life I thanked God for a headache.

In my case there has never been a regular succession of any set of symptoms in the premonitory stage. The seat of the pain has varied, but it is always in evidence. After the head begins to ache I have no power to do anything, am overwhelmed and cannot move or think. I can only go to the quietest place to be found, muffle the telephone and door bell, and groan it out. At the height of the paroxysm there is a complete arrest of intestinal peristalsis. When intestinal movements again begin the storm is most over. It is useless to attempt to describe the pain, but it is more crushing and overwhelming than any neuralgia of the fifth pair I ever experienced. A man can stand neuralgia but before a

migraine he succumbs, helpless and forlorn. The pain ceases, weak and weary the patient sleeps some hours and wakes as good as new, with, if anything for a time, greater capacity for work of any kind, with no fear of a recurrence of the migraine for an indefinite period in spite of fatigue or worry.

Migraine is sometimes mixed up with other forms of headache, but a careful consideration of the course of the attacks will enable us to separate them. Migraine is a temporary affair, rarely lasting more than 24 hours; often half of that period. When the pain extends beyond two or three days usually it is not migraine.

Migraine leaves no tender spots in any of the affected nerves. The nervous storm leaves no signs of its passage. Recovery is immediate and complete. We are ignorant of its causes. We have plenty of theories about it. Uric acid, anemia, stomachal disorders, eye-strain, reflex irritations from distant points, have all been considered causes. Samuel Wilks first taught that it was a central neurosis. The only thing you can say, and that is a confession of ignorance, is, that its victims are built that way.

The periodicity of its attacks lends support to the view that during the intervals the victim stores up energy in the nerve cells, and with this storing of energy their equilibrium becomes unstable, and then sudden noises like the report of a gun, odors, flashes of light on the retina, fatigue or night vigils, precipitate the attacks. The "discharging lesion" comes like lightning from the sky and the victim falls.

The subsequent freedom from attacks for an indefinite period under all circumstances shows a resemblance to epilepsy. What structural change there is in the nervous system which produces epileptic seizures is guessed at only, and we know still less about the essential cause of migraine.

Simple variations in daily habits are often followed by migraine, even when these changes are most healthful. Many years ago, while teaching, I used to devote Saturday to

botanizing and other rural excursions, and I always brought a headache home with me. I was forced to abandon them.

The symptoms of the disease vary with the patient. In some the stage of disordered sensation is less marked than I have described in my case and is limited to feelings of weariness and mental irritability. The second stage ushered in with pain sometimes overwhelms them, they become delirious and even unconscious, with cold extremities and pallid faces. Others vomit excessively; some with and others without relief of the headache.

Spitzer has a theory that migraine is due to stenosis of the foramen of Monro. Stimuli increase the size of the choroid plexus, causing stasis of the cerebrospinal fluid When there are small adhesions between the pia and the cortex dragging them by distension of the ventricles causes the aura. When the distended ventricles press the brain upon the irritated pia there is migraine on the opposite side. When the internal pressure becomes strong enough the foramen is opened and the attack subsides. I confess this baffles me. Sihle says the prefrontal pain is due to vasomotor spasm; that in epilepsy the aura and spasm are on the same side, and the pain is crossed or opposite to the aura in migraine.

Infield reports a migrainous mother, whose daughter was also migrainous, one of whose attacks was succeeded by hemiplegia and hemianopsia. This gradually subsided followed by spasmodic attacks in the right arm which were increased by exertion and menstruation. The attacks of migraine became infrequent. This looks as though a Jacksonian epilepsy had taken the place of the former migraine. Others have reported cases in which epilepsy has supplanted migraine. Ainstie says spasmodic asthma, epilepsy and migraine belong to the same group of neuroses.

As to the scintillating scotomata, when the irritation in the optic tract is behind the chiasm, the manifestations will be bilateral; when in front, they will be unilateral.

Diagnosis: Transient recurring headaches limited to the territories mentioned before, preceded by any of the psychical and sensory disorders described above, with or without vomiting, leaving no tenderness in the course of the nerves involved, are probably migraines. If they are found to be hereditary, the diagnosis is complete.

Prognosis: I don't know that a case of hereditary migraine was ever cured by medicine. They get well in women when they reach the climacteric. In men they last through life usually, although they become less troublesome. Probably good hygienic surroundings, good food, freedom from stress of any kind, tend to lessen the frequency of the paroxysms, and yet, I am not sure of this.

Treatment: For the relief of the pain I use morphin 1/25 to 1/16 of a grain, and go to bed. Others use the coal-tar products, which, while they are efficient in large doses, are dangerous and should not be used. In some cases they fail. Cultivate fortitude and patience. Learn to "grin and bear" the pain and the recovery is just as speedy and more complete.

To lengthen the intervals between the attacks I use cannabis indica in one-fourth grain doses of the extract for some weeks, three times daily, increasing the doses to the point of toleration without mental disturbances if necessary. We should try to correct all errors of physiologic functions, stomach, bowels, uterus, eye-strain, and so remove contributing causes.

When vomiting is severe and the vomitus very acid, wash out the stomach and give alkalies and effervescing drinks. Hot and cold applications, as the patient may prefer, are sometimes palliative. Whitehead cures cases, he claims, by the use of a seton, for months, in the back of the neck. Bromids to saturation, cinchona, arsenic, everything has been used in this neurosis. From my own experience I should say our successes in these cases are in same proportion as they are in epilepsy.

DISCUSSION

Dr A. R. Baker, Cleveland: I have been accused of curing all sorts of things—hairlip and bow-legs—with spectacles. I will not quite stand for that accusation, but I can say that I have cured migraine with glasses. I do not say that I have cured every case, but I have cured many. I suffered with migraine myself, as long ago as I can remember. Among my earliest recollections is my habit of crawling off into a dark room where nobody could find me and fighting it out there alone. This continued, and as I grew older became worse. Patients whom I cured of migraine told me to take my own medicine and put on glasses. I thought my headache came from some other cause. However, I did not get any relief until I went to an oculist and had glasses fitted to my eyes. I can bring on an attack of migraine now by using my eyes too much, as I have a habit of doing so occasionally of reading or writing all night. Spectacles will not relieve eye-strain altogether, but they do relieve it greatly. I have seen many cases of migraine in men as well as women who were cured or got well at about the age of 45 or 50. This I think is the rule—it is the exception when migraine continues on into later life as it has in the case of the essayist; but we are not relieved of the eye-strain altogether after 50, especially a man of literary tastes will continue to use his eyes as long as he lives, and as a consequence may have migraine almost as long as he lives. This, however, does not apply to the majority of people; they use their eyes less as they grow older and with progressive presbyopia relieve the eye-strain. I could recount many cases of migraine relieved by glasses. I recall one patient who had suffered with migraine all his life. I fitted him with glasses several years ago, completely relieving him of his headache. He did not live in this city, but the other day he was passing through Cleveland and he stopped off to tell me how much I had benefited him in the fitting of him with glasses. He said: "I had been a sufferer with migraine all my life. You fitted me with glasses and cured me of my headache; and that is not all, there is something else I want to tell you. I also suffered with constipation all my life, I spent hundreds of dollars to get relief from this. I never passed a day without taking something to move my bowels. I went to all sorts of springs, etc., in fact exhausted every resource to cure myself of

this constipated habit, but nothing I did was of any avail. Now since putting on glasses I have not taken a pill, or any kind of a cathartic." This man's stopping off to tell me this was nothing new to me, as this is the experience of the oculist every day. You not only benefit the headache, but the general health of the patient as well. Very frequently patients who have been relieved of migraine, or eye-strain in the use of the proper glasses, will begin to take on flesh rapidly. I have known cases where 20 to 30 pounds have been added to a man's weight in a few months. Now you will say that I am curing hairlip and bow-legs with glasses when I stop. In conclusion I should advise you all to read those interesting books of Gould "The Biographic Clinics." While some of his conclusions may be far-fetched, yet there is an element of truth in his observations that we should all hold if we hope to be of the greatest service to our patients.

Dr J. W. Costelo, Sidney: I wish to state from a little personal experience that my views are not very much along the lines of the essayist. I have been cursed with this disease five to eight times a year for the last 35 years. I have consulted oculists and they have held out a great deal of relief which was not forthcoming. It seems to me that we may consult all the different specialists in these things and they all promise relief, but somehow it does not seem to come. My experience is a good deal like that of Dr Kinsman, of Columbus. When these attacks come, it is not the ordinary headache you are called upon to treat and prescribe for, it is not a thing that a little migraine tablet will relieve, but it is a thing that unless you are extremely careful and extremely conscientious will cause the morphin habit in more instances than it should. Now, gentlemen, I believe in being fair in these things, and I believe in educating my patients to understand some of the things which I believe myself. I do not believe in administering remedies and pretending to do things for patients that I know I cannot do for myself. I tell you that this experience of getting off in the dark corner has remained with me. I am afraid to take morphin because I know just to what it will lead—I am afraid to take the coal-tar products because of the dangers connected with them. If there is anything that will relieve a genuine attack of

migraine my study of this subject for the last 25 years has not enabled me to find it.

Dr John A. Thompson, Cincinnati: With me migraine is a hereditary neurosis which I got from both sides of the family, father and mother. I do not know of a single relative down to forty-second cousins on either side that do not have the periodic attacks. I have considerable of a personal interest in this subject for this reason, and I have come to this conclusion that in migraine each case is an individual study. You must find for each patient the remedy for that individual, and treat him along that line. Glasses relieved for me a supraorbital neuralgia but never had a particle of effect on the recurrent attacks of migraine. Dr Kinsman finds relief in a small dose of morphin. If I wanted to prolong my attack from 24 to 48 hours longer than the usual period a single small dose of morphin will do it, and it is so with all of my relatives to whom morphin has been given for this trouble. We seem to have along with this neurosis an idiosyncrasy against morphin. In my own case the preliminary of the attack is an excessive sleepiness. If I can, when I feel this preliminary drowsiness coming on, slip away from my work, from my telephone and office bell, for a couple of hours and sleep, that is the end of the attack. If I am unable to get this rest, or if the rest is broken, I am in bed with migraine for the next 24 hours. As I grow older (and this is the case with all of my relatives) the attacks get further apart. Acting on the cue given by this preliminary drowsiness, when I take any remedy at all, it is a single dose of chloral, not over 10 grains. The one dose is sufficient to relieve the pain and put me to sleep, and that is the end of the attack. This does not work with all of my relatives however. So back to the point with which I started, you must study the individual case and find out by experiment what will relieve in that case and stick to it with that patient.

Dr A. A. Starner, Galion: I have been troubled with headache more or less all my life. Dr Kinsman cures his cases with morphin, Dr Baker with glasses, and I generally cure myself with active cathartics. I have frequently taken morphin and with no results whatever. It fails to relieve my pain to any great extent, except in large doses. However, when I am pressed with work I sometimes take one-

quarter grain which will relieve me of the severe pain for six to eight hours. In the treatment of migraine not a word has been said in the discussion on the subject of diet. I think that diet will do about as much in the majority of cases as anything else in the way of aborting the attacks. I have prescribed outside of the diet to cut short the attacks the fluid extract of cannabis indica in from one to ten minims at a dose, and with that single drug I believe that I have obtained the best results, better than with anything else. For myself I have taken everything in the category of medicine, and there is nothing, as I have said before, but an active cathartic that will do me any good. My bowels become paralyzed apparently, and the attacks last without cathartics from one to five days. If the attack continues for three or four days I generally take a rectal injection. I have taken handfuls of pills, acetanilid, caffein citrate, morphin, the bromids, combined the bromids with ergot, etc., etc., and all to no purpose.

Dr T. N. B. Whiteleather, Malvern: I am certainly glad to have heard the essayist on this subject as it is certainly one that more or less concerns the general practitioner. It makes little difference how small a practice a man may have, he will always have some cases of migraine among those he treats.

I would like to relate a case which has come under my observation. The patient is an Englishman, 42 years of age, a molder by trade. He has been subject to attacks of migraine since a small boy. He has frequently told me "that at the height of the period the pain is so severe that if a person were to pound a spike into his cranium, it could not hurt him worse than the pain," and I really believe this statement. I have seen him with tears rolling down over his cheeks. During the last five or six years he has kept account of what it has cost him for the time he has lost in working at his trade, and it amounts to $60 or $70 per year.

Dr Kinsman has spoken about the tender spots occurring in these cases, saying that they did not occur. I am led to differ from him in that matter. In this case invariably after an attack of migraine there is a superficial tender spot over the corresponding area of the cranium. In this case the headache may occur for one night. He will then have relief for a few hours, and then the headache appears

on the opposite side and he goes through the same experience on this side as he experienced on the other.

In regard to the etiology of this affection we know very little. We are as far from the etiology of it as we are from the etiology of epilepsy, while there may be some factors in common with both diseases.

In regard to nerve combustion that some authorities give as the cause, I have often thought that might be the cause, yet in this case which I have related to you we have the headache occurring tonight and tomorrow the patient may be free and the next day he may have a recurrence of the attack. Now it appears to me that if nerve combustion was the cause of these attacks, a recurrence would not come on so soon. If it occurred in three or four weeks I would believe more in this theory.

The gastric neuroses which occur are different in migraine individuals. I find in the majority of these cases that there is some gastric disturbance. This party never vomits, he feels nauseated at times, his breath also becomes very foul, and these are the only indications of the gastric disturbance in this case. As to the treatment in these cases, I am inclined to the belief expressed by the essayist, that very little can be done. I have followed out one theory which I find invariably gives some relief, and that is to make the patient drink plenty of hot water. I emphasize the word "hot" because I believe poisons are secreted in the stomach at these times, which, being concentrated, is reabsorbed and carried through the system, poisoning the nervous system. By deluging the system with hot water and diluting the contents of the stomach the headache is relieved to a great extent.

As the essayist has said, we have considerable trouble with the bowels at the time of these attacks, and I believe an enema a very good thing to use at the beginning of the attack, as it frequently gives relief.

Dr Geo. H. Colville, Circleville: The thing that occurs to me in the discussion of this paper is that we are prone to regard migraine as a great many people do a heavy cold; calling every cold grip, and every pain in the head migraine. I think we do not make a critical diagnosis between migraine and other affections. Supraorbital neuralgia, or neuralgia affecting the cranial nerves, is often called migraine. As the essayist has said, these conditions leave tender spots.

Migraine I believe does not, or at least it has been my experience that there are no tender points following it, the opposite being the case with neuralgia. Supraorbital neuralgia may be relieved by anything which will act as a sedative, and at the same time we must remove the cause. It may be a malarial neuralgia and in that case it is prone to recur. Frequently patients are prone to have it on the opposite side. If it occurs in purely neurotic cases, my opinion is that when the nervous energy spends itself the neuralgia is gone. As to the gentlemen whom our friend Dr Baker cured of migraine by prescribing glasses, if it was due to eye-strain that would come on at irregular intervals while migraine comes on at fairly regular intervals. I have been acquainted with the essayist long enough to know that for years he tried every oculist that came along for glasses, in the hope of getting relief in this way, but to no avail. The point I wish to make is this that we have become mixed up in our diagnosis between neuralgic headaches and migraine.

Dr Young Stephenson, Georgetown: This is certainly a very important subject. We have heard a good many different opinions as to the treatment but very few as to the cause. I have had a great deal of experience with migraine and in nine cases out of ten it originates from constipation, and when I have treated it along that line I have had most excellent results. This affection is not a disease of the brain but a reflex action on the nervous system. If you can open up the avenues and give the system free action to eliminate the causes of this reflex action you are driving in the right direction to relieve the trouble. I have always gotten good results from the use of phenacetin and acetanilid for the relief of the pain, and then I use active cathartics to open up the bowels. Then if there is a predisposition to nausea, which occurs in some cases, I use carbolic acid, two drops to the dose, and that relieves that trouble. If there is any malaria in connection with this trouble I use Fowler's solution of arsenic. I have always found these remedies to meet the demands in most of my cases. The reading of the paper demonstrated clearly that it is undoubtedly of reflex origin because at a certain period of life it ceases to exist. If you will examine your cases carefully and investigate them thoroughly, you will find nine out of ten cases are caused by a severe case of constipation; there is no action in the

bowels at all. Nature makes the attempt to accomplish her work in the bowels, and failing, there is bound to be some reaction occur, and the brain is the first place that feels it. Now when the system is relieved the headache is relieved, and the patient is satisfied that you have accomplished a good work. I have one patient who suffers with these headaches whom I have treated for about a year. She has these attacks periodically of a very severe nature and she has come to the conclusion that she knows about as much about the treatment as I do. The first thing she tells me is to give her something to move the bowels and I always do it. I give her phenacetin and acetanilid for the relief of her pain, and if the pain is very intense or severe I give a small dose of morphin to quiet the pain. This plan of treatment works admirably in my hands.

Dr Frederick K. Smith, Warren: I did not have the good fortune to hear Dr Kinsman's paper, but I have heard some of the discussion. As one speaker has intimated, there is not, I think, a definitely limited symptomatology, or pathologic condition, to which we can apply the term migraine, or sick headache. In one person one set of symptoms will develop, and in another person another set. Yet there is a general group of correlated symptoms, apparently resulting from a similar underlying cause in the various cases, such that the presence of any part of this group in a particular case may justify the application of the term in question. In some persons this affection will manifest itself always on the same side of the head, in others it will appear first on one side and then on the other. The pain may be in the eyes, or in the temples, in the occiput, and occasionally in the vertex, or again it may start from one of these points and extend until it involves the whole head. From my own observation and consideration of these cases I have come to believe them in a very large proportion to be due to eye-strain. That I think is the main element in the causation. In regard to other symptoms which appear in connection with the attacks, the stomach is sometimes involved at the beginning of the attack, and at other times the stomach symptoms come on later. Sometimes we have stomach symptoms which are to all appearances due to the same cause without very much headache. Sometimes the attacks come with great regularity, and sometimes they are very irregular. Sometimes we can directly trace the

trouble to the use of the eyes for close work, this excessive use bringing on an attack; at other times there may be no apparent connection with the use of the eyes or it may be due to straining the eyes in other ways. I find many persons have the attacks brought on by driving, riding in a train, or on a trolley car, this latter being quite a frequent cause. I have seen case after case exhibiting such a group of symptoms in which the symptoms have been greatly relieved by the use of proper glasses. These cases usually have astigmatism, rarely simple hypermetropia, and usually occur in persons under 45 years of age. I have repeatedly seen cases in which the attacks had ceased, these patients being over 50 or 55 years of age, and they would tell me that in their earlier years they had attacks of migraine, but that they had ceased for some time. We almost always find that these patients have a marked error of refraction, and while perhaps we cannot prove it, it is quite certain that their earlier attacks of migraine were due to this error of refraction. There are certain cases of older persons in whom the attacks do not cease at that period of life, and there are also cases of younger people in whom, after the error of refraction is corrected, they still have the attacks of migraine. After repeated observation of many such cases extending over a considerable length of time, I am satisfied that the attacks of migraine in these cases also are due to eye-strain. In those cases in which glasses do not seem to have any particular effect in relieving the symptoms, the migraine is the result of muscular strain, which cannot be corrected by glasses. That is a subject which is more undeveloped than the matter of errors of refraction, because it is more difficult to prove that the symptoms are due to muscular strain. In some cases I have been able to prove it to my own satisfaction, and in many others, although objective proof was lacking, I have felt convinced that the migraine was due to eye-strain resulting from a lack of muscular balance.

Dr W. R. Hosick, New Comerstown: Since the receipt of the program of the Ohio State Medical Association meeting this year I have been looking forward to hearing Dr Kinsman's paper with the hope that something might be offered by him by which we might be able to combat this affection. He has given us a very interesting and able paper, but from his statements I should judge that we are about as able to treat this disease as he is, which to the general

practitioner is not very encouraging. The discussions of the paper have been many and as many varieties of treatment have been advocated, and we are left just where we began. It is to my mind a very unfortunate thing that we are not able to more effectually combat the severe attacks of migraine. I have been very much interested in one patient who has been under my care for a year. She is a school teacher, a young lady, and at the end of the school week every two weeks she has a very severe attack of migraine. I have tried almost all of the remedies which have been recommended for its relief. I have found one remedy which seems to afford her relief and that is the tincture of gelsemium, which I believe has not been mentioned. The relief of constipation and the correction of errors of refraction, by eminent oculists, in this patient does not seem to give her any relief. I feel very much disappointed at the results of the therapy in this trouble, and, as I stated above, we are left just where we began.

Dr Oliver Tydings, Piqua: The discussion of this paper has been very long, but I am not willing to have it go on record that we as a body have closed the portals of hope to the public for the relief of trouble of this kind. Dr Kinsman's case seems to be unique in the history of migraine, and Dr Costelo's the same, but in the study of these cases we must remember one thing and that is that the human being is not made up of a single organ and that the others are purely supplementary to it. In the first place, let me say that I do not believe that we have any pain except from a cause. To get definitely at the cause, as Dr Stephenson has remarked, is our first duty. Personally, I believe that the majority of these cases are dependent upon conditions in the intestinal tract, or upon eye-strain, as has been mentioned here to-day. I know that many cases of migraine are corrected, and not only the migraine but the stomach trouble, as well as constipation, are relieved by the use of proper glasses, but that does not cover all. I will very briefly call to your attention one case. The patient was the wife of a physician living in my town and had been the victim of intense suffering from migraine for years and she had a refractive error of 1+. She spent some time at one of the hospitals in Columbus, but not obtaining relief there she went to Cincinnati and came back with a diagnosis of meningitis. I had just returned to the town at the time and her husband being a friend, and

having some confidence in me, he came to consult me about his wife. I made an examination of her nose and found a complete stenosis of one side produced by a polypoid growth on the middle turbinate, and yet that woman came home from Cincinnati after consulting a neurologist of a State and national reputation with a diagnosis of meningitis. The removal of that middle turbinate relieved her suffering. There are many and many of these cases, so do not give up hope. If Dr Kinsman will come over to Piqua and let me study his case over I believe he will be able to make a different report from what he does now. The only way to relieve these cases is by finding out what is the cause of the migraine. There is hope for the relief of these cases, and it will be found in the proper diagnosis of the causation.

Dr D. N. Kinsman, Columbus, closing discussion: I have reported a case today which I have studied for 60 years. I have tried to give you what I believe to be the principles upon which to form a correct diagnosis of migraine. I have never seen so many men who have treated migraine so variously and so successfully as you do. As to Dr Baker, he seems to have been more successful in the treatment of migraine and constipation by correcting errors of refraction and eye-strain by fitting proper glasses than in my widest dreams I believed possible. I congratulate him upon his success.

We know no more about the pathology of migraine today than we do of the pathology of epilepsy. There are cases in which migraine has been acquired. There are cases in which epilepsy has developed as a result of the disease. There are cases which, as far as we know, are hereditary. I have in my study of this disease found more cases that showed distinct heredity as a cause than anything else. I have listened to the discussion here and I have heard of cures wrought by cathartics, the coal-tar preparations, and by the fitting of glasses. All this indicates to me in the first place that the gentlemen have not made a correct diagnosis of migraine in this case; that their cure has related to mitigating the pain of individual attacks and not in curing the tendency thereto. I have tried every remedy that is given under heaven among men for the relief of this neurosis in my own case. I have had my eyes corrected and I can use them from 10 to 12 hours without any headache developing

except when I have entered into that morbid cycle, when anything will cause an explosion, and I go down.

I am sorry to say that further than is indicated in the paper I know of no treatment that is of value in curing this neurosis. Some get well. I said that I had used from 1-25 to 1-16 of a grain or morphin to relieve the pain, but this does not relieve the disordered sensation which comes with migraine, and it was never relieved by any narcotic or anything that I have ever used.

Bear in mind that there are two factors in this disease. pain and a terrible sense of physical decrepitude and mental weakness that is not present in any other affection, and the pain is unlike that of any neuralgia that occurs in the fifth pair, and the man who has migraine, as I have described it, and as I have felt it, cannot have migraine and take compound cathartic pills and practice medicine at the same time.

The Plea of Insanity

By R. H. Grube, A. M., M. D., Grape Grove

The fact that where the plea of insanity is set up each side can marshal an equal array of medical witnesses is a disgrace to our profession. That the plea has so often succeeded, to the subversion of justice, is the scandal of the courts and has given color of excuse for trial by mob.

We have arrived at a time when there is no longer an excuse for such a state of affairs, and when the two professions, law and medicine, should come to a better understanding on this important subject.

The law of this State does not attempt to formulate a definition of insanity other than the general one of the loss of accountability by one who has reached the age of discretion. Moreover, it regards everyone who has reached that age as being sane until he has been proved to be insane.

The law is exceedingly conservative and while there is no accounting for the origin of a statute the great fabric of jurisprudence has been built upon Aristotle's famous canon "That which seems to all men (to be), that, we say is." That is, the common law out of which the statute law has been

evolved, and by the light of which the statutes are interpreted, is what has seemed to the body of men in the past to be just. So, while philosophers have debated from time immemorial and will probably go on debating whether or not man is a free moral agent, the common sense of men is that he is free, and is accountable for his acts.

This is true not only of acts in cases in which the judgment is deliberately and consciously formed but also of acts done automatically. In other words, we recognize accountability for acts done automatically because what we call character is the accumulation of secondary or acquired reflexes, the bundle of habits, which the proverb says man is. A man is not a criminal because he has committed a crime, but he commits the crime because he is a criminal and his criminal character is the result of his previous years of wrong thinking and acting. In the absence of a normal conscience developed by religious or moral training the character must be formed by means of the instinctive dread of punishment. Even the dumb brutes which have not a vestige of conscience can be made by this fear to avoid doing certain acts. The shepherd's dog loves mutton as well as other dogs, but the fear of punishment keeps him from killing his master's sheep.

The function of criminal jurisprudence is neither retributive nor philanthropic; it is protective. The tendency of modern civilization is to exalt the social unit at the expense of the individual. If the individual is punished it is intended more as a warning to others than as curative to the individual. If the defense of insanity is carried so far as to cover every mental aberration then punitive justice will have lost its function.

At the same time the law is exceedingly watchful over the individual's rights, and especially the rights of the insane, for, while it throws upon the defense the burden of the proof of insanity, when once the presence of insanity has been established and an apparently sane act of the subject is called in question the burden is shifted to the accuser and he must prove that the act in question was a sane one.

Common sense is not always an infallible guide. It was the common sense of men that the sun rose and daily moved across the sky, until science taught them otherwise. Fortunately science has come to the rescue of the traditions of the law in the present instance and has confirmed by the canons of logic the conclusions reached by common sense. The new psychology teaches that the mind and brain are one —one thing with two sides capable of being influenced through either. Every thought implies a rearrangement of brain cells and conversely every change of arrangement or nutrition of brain cells causes changes in the mental states.

There is a generic type of man and conformity to type is the rule. Marked departures from this type are due to defective structure, faulty training, or perverted nutrition of the brain, which is disease. The law does not recognize faulty training as a valid excuse for crime, and the maxim "Ignorance of the law excuses no one" is an old one. Of brain disease the courts are not capable of judging and rightly look to physicians, whose business it is to know, for guidance. There has been so much of the blind leading the blind, in the past, that there has been much of falling into the ditch. Most physicians feel themselves competent to pass judgment on the insanity of a subject, but very few are willing to undertake a carefully worked-out diagnosis of his case. The chief object of this paper is to ask for more careful attention to this most important branch of our professional work, on the part of the general practitioner, not only for the purpose of giving aid to the courts but for the early and careful diagnosis of insanity at a time when the most can be done for its cure.

The statement was made before this assembly one year ago, and I repeat it for the sake of emphasis, that in the light of modern science the diagnosis of insanity can be worked out with the certainty of a mathematic proposition if the same amount of labor is expended on the task. For a physician to oracularly tell the court that the accused was insane when he committed the crime is no more rational or

satisfactory than it would be to tell a patient who asks for a diagnosis, that he is sick. This is especially patent when such a statement is likely to be met with another oracle which says that he was not insane.

Medical science has not succeeded in defining insanity any more satisfactorily than has the law, and it never will, because insanity is not a disease; it is a symptom of disease and not of one disease but a multitude of them. When the physician can tell the court positively that the accused has a diseased brain, and can predict the future course of that disease with the reasonable certainty that attaches to a case of typhoid fever, the plea of insanity will cease to be a reproach to both professions. I believe the time has come when he can do this, and that any intelligent physician can easily qualify himself to give such an opinion.

The physician should be of assistance to the court in determining when the accused is not entitled to the plea of insanity as well as when he is. I need not more than merely refer to the possibility of malingering and the many ingenious methods for its detection. It is the border-line cases that give the courts the most trouble but it is in these cases where the physician can be of the greatest assistance to both the court and the accused because they generally imply the incipiency of the disease. It is in respect to these cases that we may as well disabuse our minds at once of that ancient fiction of temporary insanity because there is no such thing in the sense usually implied by the term. Insanity has its exacerbations and intermissions but the diseased brain is there always. It is here, however, where we encounter that large class of border-line cases where the accused is neither imbecile nor insane but in which the brain is defective in some of its parts—a crippled brain. To this class belong the "cranks" as they are popularly called but in the nomenclature of the newer mental science termed degenerates. Are these subjects entitled to the plea of insanity? The courts by their practice answer no, and psychology confirms their answer. If the dumb brutes through fear of punishment can

be kept from doing prohibited things, so much more can these people who have all the faculties of the brute with the majority of those of humanity. Their instinctive dread of punishment should be strengthened by example, not weakened by indulgence. Defects of the brain like defects of the limbs can be compensated by proper training.

There is a standard of morality that seems to all men to be right and any marked departure from this standard the courts regard as either crime or insanity. They recognize no such thing as moral insanity, and rightly. Insane people do immoral things but that is a part of their insanity and does not constitute it. As an illustration, alcoholic drinks are estimated as being the cause of about one-half of all crime, and though alcohol paralyzes the volitional judgment and so makes an automaton of the drinker, the court holds him accountable if he commits a crime, because it considers him responsible for having permitted his character to become criminal. On the other hand insane persons, especially in the early stages of their disease, often use alcohol to excess and so commit crimes under its influence. Here the physician should be able to show that the crime was due to the insanity rather than the alcohol and so prevent the court from imposing an unjust punishment.

So too with acts inspired by passion or emotion, which are so often criminal in their nature. It has long been a settled maxim of the courts that the law assumes that a man is bound to keep his appetites and passions under control, so that the angry man like the drunken man is held accountable for his criminal character rather than for the specific crime committed, and the punishment imposed is intended as much to admonish others as to prevent a repetition of the offense by the one punished. It would be manifestly unfair to thus make an example of one with a diseased brain; but to know that a brain is diseased requires some one who has made brain disease a study, and I believe that our courts will welcome such a one who can help them in what must always be a painful dilemma, where they must decide between per-

mitting demoralizing crime to go unpunished and inflicting undeserved punishment on one who is the most unfortunate of all men.

What I ask is within the reach of all physicians. The subject of insanity has been so thoroughly worked out and simplified in the past few years that the physician has but to give a comparatively short time to any one of the many manuals on insanity to fit him to deal intelligently with his subject.

Dilated Heart

By D. C. Houser, M. D., Millerstown

Dilatation of the heart, except in acute overdistention, is rarely primary, but secondary to some affection, either acute or chronic in nature, as pericarditis, acute and chronic myocarditis or valvular disease, and a diagnosis of the underlying cause should be made if possible. More or less dilatation of the heart is present whenever there is cardiac incompetence from whatever cause, but I shall, in this paper, endeavor to portray what may be considered as overstrain of the heart-walls, either acutely or gradually induced without previous recognizable myocardial or endocardial disease.

A dilated heart is one whose chambers have an increased capacity. Most cases of dilated heart are also hypertrophied. A dilated heart may be as large, or even larger than one only hypertrophied, but the muscle is flabby and does not keep its shape. The muscle is usually paler than normal. It may affect only one chamber or the whole heart. The valves usually become relatively insufficient, due to stretching of their ostia or the cardiac walls.

Etiology: "Cardiac dilatation may be said to be a disproportion between the work the heart has to do, and its ability to do it." This undue demand may have existed for years in the shape of high arterial tension.

Some unexpected call for extra effort, when without it, the organ might have done its work for years longer. This

is the way a dilated heart often follows compensatory hypertrophy in valvular disease. Such an exciting cause may be the lifting, or carrying of a heavy weight, a hasty run, or any extra exertion.

Anxiety, grief or fright, through their action on the inhibitory nerve of the heart, may cause dilatation.

Romberg lays stress on the deleterious influence in this respect of acute infectious diseases and cites instances in which he has observed dilatation and ultimately fatal insufficiency follow an attack of influenza.

Babcock cites a case of a gentleman of 57 whose dilatation and eventual death, from cardiac asthenia, were attributable to his having carried a heavy traveling bag several blocks in Denver, where the altitude is 5280 feet. He says: "As this man was corpulent, weighing 192 pounds, his heart was probably not sound at the time of his exertion, and yet it had been equal to all demands up to this time."

The heart muscle, as well as the skeletal muscles may be weakened by years of application to business or intellectual pursuits, and without any preparation such a person takes to violent exercise to improve his condition. I once had under treatment, for a time, a middle-aged man who had left-ventrical dilatation with mitral incompetence, as a result of a single effort of this kind. He rode a wheel at a scorching pace for some distance. He was not aware of any trouble at the time, but soon afterward was seized with alarming fainting spells. His heart muscle being sound it soon recovered its tone. Babcock cites three instances occurring in men whose occupation was that of building inspector; their work necessitating the climbing of ladders or long flights of stairs; in one case he says that no relief could be obtained until he changed his occupation to an office.

Tobacco, sexual excesses, late hours, social dissipation, dancing, etc., are all causes. One man breaks down in his nervous system, another develops a cough, while another develops cardiac dilatation; such examples are not confined o the male sex.

Many a jaded matron, who declares that she is worn out by the demands of society, is, perhaps, suffering from a dilated heart.

I think that there is danger of dilatation from immoderate exercise in children, and young adults, as well; football, base ball, bicycling, etc., are not fancied dangers, but positive dangers. It is said that a growing boy will stand a degree of strain disastrous in a man of 40.

Clifford Allbutt calls particular attention to unknown "fatigue products" which are developed during severe exercise as being a cause of acute dilatation.

SYMPTOMS

The symptoms of dilatation develop slowly or rapidly, according to the development of the dilatation. As the heart-walls begin to grow weaker, the pulse becomes faster, often irregular, and in many cases intermittent. Cardiac impulse becomes weaker, its area of dulness increased, and its sounds feeble. Soon will be noticed more or less shortness of breath on exertion, and a feeling of actual weakness. A change in color, from a reddish hue of health to a bluish gray tint of capillary stasis.

Visceral congestion soon appears. The urine lessens in amount, becomes high in specific gravity and often contains traces of albumin. The liver increases in size, a feeling of fulness in the right hypochondrium is present, a dull pain in the back below the shoulder, the inferior margin of the liver becomes palpable and may be painful.

Congestion of the gastrointestinal veins is shown by an impaired appetite, flatulent indigestion, a feeling of fulness after meals, constipated bowels, piles may develop, and sexual power becomes deficient.

Women are apt to suffer from leukorrhea and derangment of the menstrual function. Congestion of the lower extremities leads to puffiness about the ankles which disappears after a night's rest, but as cardiac incompetence increases, this edema remains. Pitting on pressure is pro-

nounced and found to gradually extend upward; thus grow the symptoms of failing circulation.

The patient is soon compelled to keep his room. Mere shortness of breath is not all that shows pulmonary congestion now, but cough with frothy, perhaps bloody expectoration; unable to lie down; talking causes breathlessness. An examination of the lungs reveals fine crackling râles, also dulness at bases, in short, hypostatic congestion. The apex beat is but a feeble tap and, perhaps, much outside the left nipple line. Absolute and relative cardiac dulness are much increased, and may extend from close to the right nipple to the left anterior axillary line. The heart sounds are feeble, and there is apt to be a systolic murmur.

The leak through the tricuspid valve is shown by a venous pulse in the external jugulars. The veins of the neck stand out like blue cords, and, if pulsation is not present at all times, can be plainly seen when the patient coughs or makes a forcible expiratory effort. The state of things is now pitiable, and steadily grows worse. General dropsy develops, filling all the serous cavities, somnolence and often low muttering delirium, and death.

The symptoms of acute heart strain are those of deficient arterial circulation, *viz.*, a rapid, weak and irregular or intermittent pulse, with signs of an over-loaded venous and pulmonary system, dyspnea, exhaustion, precordial pains cyanosis, congestion of the liver and a venous pulse of tricuspid regurgitation.

I once saw an instance of acute heart strain in a powerfully built young man, belonging to a college foot-ball team. He walked off the field after the contest was over, but looked blue in the face, complained of pain in the region of the heart (R. V.) and the doctor detected absolute dulness to the right. The symptoms in this case did not disappear for a number of days and it was months before it gained its wanted steadiness.

PHYSICAL SIGNS

Inspection: This is of but little value.

Palpation: Affords some knowledge concerning the pulse and hepatic congestion; also in the feebleness or strength of cardiac contraction.

Percussion: This, as a rule, is our most valuable means of determining whether dilatation is present.

In dilatation of the left ventricle, dulness is increased to the left and upward; right ventricle, to the right and downward. When the whole heart is dilated, the area of dulness is quadrangular in outline with broadly rounded corners and sides.

Auscultation: The heart-sounds are feeble; murmurs may be present; systolic tone becomes short and much like the second; the diastolic pause is shortened; the rhythm tends to disappear and the tones follow each other like the ticking of a watch. In case of extreme weakness, the ear may be able to detect but one sound. The examiner must remember that preexisting valvular disease may be and often is present, and that the murmur, or murmurs, may not be relative ones, but of organic origin. He may have to await the result of treatment before deciding definitely.

Auscultory percussion may enable a clearer outline of dulness to be made.

Palpatory percussion will not reveal much if any better results than when used alone.

Diagnosis: This is not usually difficult. The history of the case and the clinical findings of a rapid, feeble and irregular, or intermittent pulse indicate a dilated heart. A feeble, tapping, or even imperceptible cardiac impulse, an increase of relative and perhaps absolute dulness, feeble ticking sound, and, perhaps, systolic murmurs of relative mitral or tricuspid insufficiency are also evidences.

Acute dilatation can scarcely be mistaken for any other condition.

Pericardial effusion might be mistaken for dilatation, but attention to the one great differential point is all that is

needed, *viz.*, in cardiac dilatation, dulness does not pass beyond the limits of cardiac impulse, while in pericardial distention the apex-impulse is situated within the outer border of dulness.

Dilatation and *hypertrophy* can scarcely be confounded if due attention is paid to the pulse, to the nature of the impulse, and to the greater feebleness of the sounds.

Prognosis: Dilatation of the heart is not a trivial matter, and yet its gravity depends upon the state of the heart muscle, the extent of the dilatation and the length of time it has existed. When dilatation supplants hypertrophy, it is quite likely that the heart walls are not sound; therefore cannot be restored. A dilated heart and stiffened arteries are grave conditions. A dilated heart, associated with a granular kidney, should be considered a serious matter. If both arteriosclerosis and interstitial nephritis exist, it is almost impossible to restore compensatory hypertrophy. Left ventricle dilatation is graver than dilatation of either of the other chambers. In left-ventricle dilatation, the development of a systolic murmur at the apex is favorable rather than unfavorable. In persons past middle age, the condition is likely to resist treatment, especially if it has become chronic. A steady though gradual loss of ground, in spite of the most skilful treatment, proves that very little is to be expected from any management.

If serious symptoms of venous stasis have existed for some time, two states of mind on the part of the patient make me apprehensive of danger. Great restlessness and an ill-defined nervousness that keep the patient constantly moving about, and, on the other hand, a sudden lull in the distress of the patient. In acute heart strain, the prognosis is usually good if rest and proper treatment can be had.

Treatment: In acute dilatation, rest in the recumbent, or semirecumbent, position may be all that will be needed. If the patient's age or general condition justifies the inference that the heart cannot return to normal without further aid, unload the portal system by a cathartic, then give digitalis.

Strychnin and nitroglycerin will most likely not be required. The diet must be light and nutritious until a normal condition is reached. Most cases of cardiac dilatation which the physician is called upon to treat are not cases of acute heart strain, but cases of chronic cardiac insufficiency; then the treatment necessarily divides itself into the three stages of heart lesions, *viz.*, First, compensation perfect; second, compensation imperfect; third, compensation lost.

My paper, strictly speaking, has nothing to do with the first and second conditions. I will say that the treatment must vary to suit the underlying casual conditions. As regards the third condition, all that I can say is that in some of these cases nothing more can be expected than to add a few more days or weeks to the life of the patient and mitigate his suffering. In others, by skilful management, we may be able to assist the heart to such an extent that it may regain at least a measure of its former adequacy.

The great question is, how can the amount of work done by the heart be lessened, and not what medicine must be given.

It is plainly evident from the symptoms present in a dilated heart that it is not able to accomplish its work. What must be done? Lessen the amount of work. How? Put the patient to bed and keep him there, insist that he be kept absolutely in bed, not allowed up for anything whatever. The diet must be nutritious and easily digested—better be a liquid diet.

If it be found that the heart cannot be restored by rest alone, it will be necessary to aid by medicine, and digitalis is the only remedy in these cases; but it is useless to give it until stasis within the organ has been relieved. This must be accomplished by purgation or blood letting. $Mg.So_4$ is perhaps the best purge. It must be given freely, then digitalis is to be given, and to procure its full action it must be given in large doses, one-half ounce of the infusion every four hours, or 20 to 30 minims of the tincture, and continued

for several days, or so long as it continues to augment the flow of urine.

Its action must be closely watched for cumulative effects. These are slowing of the pulse to 60 or less, nausea, and a falling off in the amount of urine after it has first been increased. It must be remembered that some people cannot take digitalis without being nauseated. The most reliable indication in my hands has been the effect upon the urinary excretion. If it does not increase after digitalis has been given two or three days, even though the pulse-rate fall, nothing is to be gained by its administration at this time, and it may do positive harm; or, if after having been increased for awhile, it begins to diminish, digitalis is exerting its toxic effects and ought to be stopped at once; or, if these unfavorable signs do not appear, I make it a rule to withdraw the infusion when the eight ounces, comprised in the pharmacopoeial formula, have been exhausted.

It must be said that such cases need a physician, *i.e.*, must be treated symptomatically, and with a thorough understanding of the underlying conditions.

With this brief outline of the treatment, and a thorough realization that a long paper could easily be written upon the treatment alone, I wish to report two of four cases of which I have made a close study.

On January 2, 1903, I was requested to see Mrs S., aged 38 years, who had been dropsical for several months. She had had rheumatism at the age of 12 or 13, and again at 30, soon after the birth of her third child, but had not been aware of cardiac symptoms until September, 1902. She had then been aroused in the middle of the night by violent palpitation. A few weeks afterward she suddenly developed headache, paralysis of the right side of the face and partial left hemiplegia. This had gradually improved, leaving behind a paralysis of the extensors of the left arm and contracture of the fourth and fifth fingers. After this, dropsy had come on. For six weeks prior to my seeing her, she had been unable to lie down and had only slept by sitting with her arms supported on a table in front of her. Edema extended as high as the waist, and also involved the left arm. The abdomen

yielded fluctuation and percussion evidence of free fluid. The liver was greatly enlarged. The pulse was very small and accelerated. The external juglars were greatly distended, but did not pulsate. The apex-beat was in the seventh and eighth intercostal spaces, close to the anterior axillary line. The first heart sound was audible in spite of a loud systolic murmur which was transmitted around to the back. The pulmonic second sound was much intensified. The lungs were negative. The urine was scanty, but no albumin or casts were found.

Diagnosis: Mitral regurgitation in the stage of ruptured compensation.

It seemed useless to administer digitalis or diuretics until the excessive stasis had been reduced by purgation. She was assured of relief if she could stand some heroic treatment. She said that she would willingly stand anything that would give relief. So, $Mg.SO_4$, in tablespoonful doses, was ordered hourly until it began to operate. I learned the next day that she had taken 10 doses and had purged 12 times. Indications of improvement were noticed. She said she was ready to stand another "round," so $Mg.SO_4$ was repeated next day. The effect on the dropsy was immense. During this treatment she was given strychnin in full doses, stimulants whenever needed, and a concentrated, nourishing diet of eggs and strong broths. Digitalis was now given in tablespoonful doses of the infusion every four hours. From four to six watery stools were secured each day. It was not long until she could rest in bed, a thing she had not done for nearly two months. The edema wholly subsided in about three weeks. Digitalis was continued daily in the form of the tincture in doses of 10 or 15 drops, three or four times per day. The change in the pulse is gratifying, being now about 65 and tolerably regular. The liver is still enlarged. She keeps on hand a saturated solution of $Mg.SO_4$ and takes enough each morning to secure a free movement of the bowels. She is now walking about the house and enjoying drives.

On March 4, 1903, I was asked to see Mr S., aged 68, who had been ill with heart disease for about six weeks. He gave a history of articular rheumatism at 25 and again at 40, since which time he had noticed heart symptoms. His present illness dated from about six weeks back, when he had walked about a half mile. I found him sitting up on account of dyspnea and cough, which had prevented sleep for several nights. His color was a peculiar bluish-yellow, and anasarca was extreme, extending to the trunk and including the upper extremities. The heart rate had to be counted by auscultation because of the flickering of the pulse.

As nearly as I could determine, on account of the great arrhythmia, the heart was beating between 160 and 170 times per minute. There was no cardiac impulse. Absolute and relative dulness were greatly increased, extending from one and one-half inches to the right of the right sternal margin, very nearly to the left anterior axillary line. The heart sounds were feeble, the first being partly obscured by a murmur that seemed to possess an indistinct presystolic portion; the pulmonic sound was accentuated and the aortic was weak. The basis of both lungs showed dulness that did not shift, and numerous fine, moist râles. The firm, rounded border of the liver was palpable three finger's breadth below the costal arch, and the abdomen yielded signs of ascites. The urine contained albumin, but no casts. This patient's distress was pitiful, as he was unable to eat or sleep, holding himself up in bed without even the support of pillows, laboring for air, coughing and expectorating bloody, frothy mucus. The diagnosis was plain, mitral disease of rheumatic origin, which, at last, had broken down and led to this enormous dilatation of the heart, hypostatic pulmonary congestion, hepatic engorgment, edema and ascites.

It was a question as to whether the heart-walls could ever be compensated. I gave a guarded opinion to the family. The treatment was much the same as in the previous case, strychnin, one-thirtieth grain every three hours; each evening one-eighth grain of morphin sulphate, and one-fiftieth grain of atropin sulphate to induce sleep and lessen cough. Purgation by Mg.So₄ was followed by digitalis in tablespoonful doses of the infusion.

This patient is now able to be around and compensation ‘ored.

Idiopathic Cardiac Dilatation

By G. A. Fackler, M. D., Cincinnati

During the past decade idiopathic enlargement of the heart due either to dilatation of its cavities or hypertrophy of its walls has been the subject of extended discussions. The omission of a historic review of the literature bearing upon this special subject will not be regretted, inasmuch as, while it might testify to the erudition of the author, it would not render valuable aid to our proper comprehension of these cardiac lesions; on the contrary, it would expose, perhaps add to, the confusion which has marked many reports by various authors. The prime postulate upon which I desire to base my contribution is the elimination of the conditions which have been erroneously incorporated in the list of idiopathic enlargements of the heart, and therefore to concentrate our study upon well-defined cases.

The exclusive use of the term "dilatation" in the title of this paper is founded upon the view that in the condition to be considered dilatation occurs *primarily* and with consecutive hypertrophy in all except fatal cases. The adjective "acute," at first suggested to limit the term dilatation, was regarded as redundant, because, with the qualifications adopted in our definition, idiopathic dilatation is constantly of acute onset. It may be regarded almost as heresy to decline to accept as members of this class of cases some reported as such by very eminent and careful clinicians, but the offense may be condoned by the effort to simplify the matter in order that we and others in the future may escape just criticism.

The endeavor to eliminate from consideration all cases in which any pathologic condition antecedent to or in causative relation with acute dilatation exists will surely be permitted, and probably applauded. In some of the most valued and valuable contributions on the subject histories of cases have been presented, a careful scrutiny of which

would not warrant their recognition as idiopathic affections under our conception of the term. Time and inclination do not permit me to quote these instances in detail, the purpose being best served by a general reference to the conditions obtaining in cases the designation of which as idiopathic was ill advised.

In the vast majority of cases cited, as you may surmise, the immediate exciting cause of the cardiac dilatation was some severe physical exertion or stress. A careful scrutiny of the histories will in some instances reveal the long-continued existence of an abnormal obstruction or resistance in the arterial, chiefly in the aortic system. Chronic diseases of the respiratory organs productive of abnormal resistance in the pulmonary arterial system are followed in many instances by dilatation of the right ventricle. The condition cannot be properly designated as primary or idiopathic when it develops in cases the histories of which disclose any chronic catarrhal affection of the respiratory tract, with possible increase in size of lung, any chronic indurative pulmonary process or any compression of the lung, even though it be only transient, as in cases of pleuritic effusion.

Manifestations of arteriosclerosis or habits and modes of living or diseases, which are well-recognized causes of the premature appearance of such vascular changes, have not been regarded by some as seriously imparing the purity of a case-history of idiopathic cardiac dilatation. Special mention is even made of the frequent occurrence of idiopathic dilatation in certain regions in which alcoholics are found in large numbers. The generally accepted view that hard labor, prolonged physical stress, inordinate indulgence in alcoholic beverages, or syphilis, malaria and other toxic agents are productive of alterations in the vessel walls, sclerotic and atheromatous in character, must and does aid us in establishing a true, unassailable cause for hypertrophy and dilatation of the cardiac walls, and places the cases in which such factors obtain outside of the pale of those regarded as truly idiopathic cases of dilatation. It is aston-

ishing, hence that histories containing the frank avowal of alcoholism or syphilis should be considered *apropos.*

Need I appeal to your knowledge of the sequence of events following the establishment of changes in the arterial walls—the increased resistance to the blood current, the increased labor necessarily thrown upon the heart muscle to supply the field, the increase in the size of the heart? No doubt the error of enrolling such cases under the head of idiopathic dilatation can in many instances be attributed to faulty examination, inability or impossibility to recognize an enlargement of minor degree, or to the fact that, ignorant of previous history or conditions, the observer sees the patient after dilatation has occurred consequent upon some physical stress. In the latter instance the subsequent history and termination of the case must be relied upon to furnish us positive or negative evidence of pre-existing conditions, which would be regarded as etiologic factors in the production of the dilatation.

I am very loth to attack the class of cases, the reports of which have really stimulated the study of idiopathic changes of the heart muscle, so-called idiopathic cardiac enlargements due to prolonged and severe physical exertion. Clear of all factors which might be looked upon as predisposing to or causing idiopathic dilatation of the heart, many cases have been reported and could be accepted as pure examples of the affection if they were not rendered imperfect because the occupation of the patients involved prolonged and excessive physical stress. That this will in a certain percentage of individuals cause premature changes in vessel walls is certain. One cause of chronic disease of the aorta is constant muscular overstrain, found, hence, more in men than in women, and whose occupations involve strong muscular efforts, continuous or intermittent. In atheromatous diseases of the aorta, for instance, the cause of the local infiltration and fatty degeneration, with, perhaps, calcareous deposits, has been shown by Hippolyte Martin to be an inflammation of the arteries of the arterial wall, the vasa

vasorum, causing an obliteration of their lumen, consequent arrest of nutrition of the tissues supplied by them and degeneration of the cell elements in the affected area. It would be difficult to understand that excessive muscular strain could produce the lesions distributed throughout the various areas within the aorta if the affection, starting from a previously healthy vessel, were due to the direct effect of the increased pressure upon the lining membrane. It would seem that in the healthy aorta there would be an even distribution of pressure. The explanation is much more intelligible when we consider that the effect of the increased tension induced by the efforts is upon the terminal arterioles distributed in the coats of the vessels. They are, as it were, between two pressures, the intraaortic and the systemic, and the greatest strain and consequent damage would be manifested at the peripheral termination in the capillaries distributed to the aortic walls. What more frequent pathologic association of aortic disease than hypertrophy and dilatation of the heart?

The problem as to the development of arteriosclerosis as a result of prolonged, severe muscular exertion has not been satisfactorily solved. It is assumed by some to be due to changes analogous to those described in connection with atheroma, especially since the two conditions are so often associated. There can be no doubt that the changes are in many cases due to a soluble poison circulating in the blood, as that which is elaborated in syphilis. One fact cannot be ignored, that the effect of long-continued muscular action must be to form a large number of waste products, which probably exert the same deleterious effects upon tissues with which they come in contact as the soluble poisons indicated above. Not only upon vessels, but directly upon the muscular tissues in which they are developed, do they act, and in this way, as Gibson has attempted to show, the nutrition of the heart muscle is impaired. These facts and theories lead to the inevitable conclusion that severe physical stress will determine in a measure the appearance of arteriosclerosis,

which, in its turn, because of increased resistance to the blood current, causes cardiac dilatation and hypertrophy, the latter changes, moreover, being hastened by the alterations in the muscle fibres due to the results of overaction. In brief, the heart changes and arteriosclerosis are consecutive and still due to the same cause.

The purpose of this rather lengthy paragraph is to fix the indubitable connection between prolonged physical strain and changes in the cardiac walls, predisposing them to dilatation when subjected to excessive stress. It is absolutely impossible to discover atheromatous changes in the aortic walls of moderate degree and not implicating the valves. Arteriosclerotic changes may exist for a long period without giving perceptible manifestations. The slowly progressing hypertrophic changes in the heart muscle are not easily detected, but being assumed to exist in patients with a record of hard labor performed for a long period, will prevent errors in diagnosis and prognosis. Literature on this subject contains the histories of quite a number of patients who, as stone-masons, hod-carriers, mountaineers, or engaged in other pursuits requiring severe muscular work, were living the very life productive of vascular and cardiac changes leading to dilatation, apparently idiopathic, but in reality secondary.

Concretely stated, then, it is mandatory in creating a class of affections, designated as idiopathic, to exclude therefrom any in which we are able to discover any reasonable primary cause for the dilatation, and which is in some way associated with hypertrophy. The confines being radically and closely drawn, the field is greatly narrowed for occupancy by cases fit for discussion. Of such numerous examples can be picked from out the mass of literature, which has, unfortunately, been burdened with reports of many impure, contestable cases. It remains for us to consider the cases belonging to the former group, cases of pure, indisputable idiopathic dilatation of the heart, cases in the histories of which nothing can be discovered which may have produced pathologic

states culminating inevitably in dilatation when the exciting cause appears.

As proof that idiopathic dilatation of a slight degree is of not infrequent occurrence, let me offer the very significant fact that, according to the reports of experienced clinicians, not contradicted, cases of slight dilatation with palpitation, dyspnea, fainting, rapid, irregular pulse and heart's action, have been observed, these symptoms yielding readily and rapidly to rest in bed, application of cold to the cardiac region, digitalis, etc. Although very rare, cases have been reported in which a single—perhaps brief, but violent—physical exertion has produced a fatal cardiac dilatation, the autopsy disclosing no abnormal formative or degenerative changes in the heart muscle. Finally, a number of case reports have been submitted according to which such violent efforts have produced serious dilatation of the heart, with no antecedent cause and with a final absolute recovery. Assuming that the smallest contribution will add to the interest and value of this rather erratic subject, I submit the histories of two cases:

Case I: Mrs A. Z., aged 24 years, is married, and has a child three years of age. Her record is exceptionally clear of any serious disease. The ordinary diseases of childhod—pertussis, measles, chickenpox—were not accompanied or followed by any serious symptoms or complications. While never a robust girl, she passed through the period of adolescence without any special organic or functional disturbances. Married at the age of 20 years, she gave birth to a child within 14 months. I am in a position to verify these statements, having attended her family during the past 15 years, and, hence, having frequent opportunities to observe her. In August, 1903, she was a woman five feet one inch in height, weighing 109 pounds, with healthy color, no manifestations of any organic defect, and especially none indicative of cardiac or circulatory disturbances. While no blood examinations were made, she showed no outward sign of anemia. Living in very comfortable surroundings, she did not possess the muscular development of a woman accustomed to harder work or pleasurable athletics.

August 10, 1903, while spending a day in a camp near the city, she, in company with her husband and two other men, was drifting in a boat on the river near the camp. At a certain distance from shore the men jumped overboard for a swim. In a spirit of fun and frolic, she seized the oars and rowed toward the shore, leaving the men in pursuit. To win the race she rowed hard and with rapid strokes for a distance of not more than 60 feet, when she experienced a sharp pain in the left mammary region, felt very weak, called for assistance and was hastily taken back to the camp. She was brought to the city and I was called 36 hours after the events detailed and found her in bed, shoulders slightly raised, antagonizing any attempt to move or be moved because of a sensation of faintness or impending syncope. Her face was pallid, with pronounced cyanosis of lips. The discoloration to a less intense degree was also evident on fingers and toes. There were subjective complaints of precordial pain, cardiac uneasiness, palpitation and tremor. Her radial pulse was weak, 116 a minute, irregular in rhythm, at times intermittent. On inspection of the chest a feeble heaving impulse was seen over an area two inches in diameter, with its center one inch external to and below the mammary lines. On percussion an enlargement of the area of cardiac dulness could be easily determined, extending at the fifth rib four and one-half inches to the left and two inches to the right of the midsternal line. Absolute doubling of the second sound and a systolic murmur at the apex were elicited by auscultation. Some cough, with expectoration of slightly blood-streaked sputum, dyspnea, some crepitation at the base of lungs, were the symptoms presented on part of the respiratory apparatus. A diagnosis of acute dilatation of both ventricles was made, with no presumption to call it idiopathic. Rest in bed in a posture most comfortable to her, ice-bag applied to the cardiac region, and the administration of champagne in small amounts because of existing nausea were ordered. On the following day a slight improvement as regards digestive disturbances and pain could be noted. Patient irritable and apprehensive, dyspnea and cough distressing and causing sleeplessness. After an interval of four days, during which she was not disturbed by efforts at examination, but during which period the dyspnea and sensation of faintness were ameliorated, a more careful examination was made.

Arterial and venous pulsations in the neck were marked. The heart's action was visible from the second to the fifth intercostal space, as was also epigastric pulsation. The area of dulness was unchanged and the heart's action more regular, the double second sound and systolic murmur persisting. The abdomen was distended, in part due to hepatic enlargement and a small amount of ascitic fluid. Back and gluteal region edematous. Digitalis, which had been given on the third day, was continued and the patient improved slowly but steadily, so that at the end of 12 days, when at complete rest, her breathing was no longer labored, pulse regular, to manifest its triple character on slightest exertion. Edema had lessened, cough disappeared, amount of urine increased, hepatic dulness diminished—*in toto,* all indications of a positive return of the myocardial activity to the normal. Now began also a reduction in the area of cardiac dulness and an increase in the force of the heart's impulse against the chest wall and of the pulse. Another week found her sitting up at intervals, with no subjective symptoms except dyspnea on exertion and some precordial anxiety. Only, however, at the end of three months after the inception of the trouble the heart had apparently resumed its normal size and all symptoms of its disturbed action disappeared. She has been in perfect health since that date.

Case II: J. C., insurance agent, aged 32 years, married, presented himself for life insurance examination on January 5, 1901. After securing a family history devoid of any hereditary taint, a personal history negative as to any diseases of evil habits, discovering no evidences of any pathologic processes, I recommended him as an exceptionally good risk. He had a rather superior muscular development, due to moderate indulgence in exercise, engaging in outdoor sports, as lawn tennis and baseball. He was a member of the gymnasium, but did not engage regulary or systematically in exercises.

July 3, 1901, after viewing an exhibition given by a professional athlete in the gymnasium, he attempted to copy some of the feats. One of these was the act of chinning or raising himself with his hands on a horizontal bar a distance of possibly three feet from the floor. He repeated the performance eight or ten times, and desisted, not only because of muscular fatigue, but also because he experienced sharp pain in the left side of the chest extending to the

left shoulder. He did not recover from the exhaustion, this sensation even growing in intensity. His companions remarked that he looked anxious and pale. On the following day, after a restless night, he remained at home in an easy chair or on the lounge, complaining of a feeling of fullness in the abdomen and of oppression in the chest, fatigue, slight vertigo, palpitation and dyspnea, constant but varying in intensity. The second night was especially marked by restlessness, cough and dyspnea, and on July 5, because anorexia, vomiting and nausea were added to the other symptoms, a physician was summoned, with whom I saw the patient five days after the accident. All the symptoms noted were marked. Facial expression anxious, skin pale with cyanotic hue, slight edema of lower eyelids and distinct edema of lower limbs up to the knees. The pulse varied from 96 to 120 per minute, was irregular in rhythm and force, soft and compressible. Apical impulse was two inches to the left of the mammary line and distinctly visible in an area about two inches in diameter, and on palpation gave the impression of a short feeble slap, followed by a sudden fall back of the organ, to use Walsh's description. Irregularity of rhythm was associated with irregularity in the force of successive beats. Percussion showed enlarged area of dulness only to the left from the third rib down and outward to the anterior axillary line. Auscultation disclosed a systolic murmur at the apex, not transmitted beyond the axilla, reduplication of weakened second sound, and a murmur at the third left interspace.

Dilatation of the left ventricle, with relative insufficiency of the mitral valve, was the diagnosis made, because we could easily exclude peri- or endocarditis, valvular disease and myocardial degeneration. Rest in bed was enjoined, ice-bag applied to chest, low but tutritious diet, with small quantities of whisky and digitalis administered.

During the ensuing three days there was noted a slight aggravation of the symptoms, chiefly of the edema, which extended upward to involve the scrotum and prepuce. At no time could we determine the existence of ascites or hydrothorax. Bronchial catarrh, cool extremities and subnormal temperature are worthy of mention. The urine was scanty, with large deposit of urates, and some albumin.

Sensorium clear. July 16, the first signs of unmistakable improvement were observed. The improvement continued steadily and slowly, marked by a gradual disappearance of all manifestations of functional disturbances, so that six weeks after the inception of the trouble the patient was able to leave the house. The enlargement, evidently due to hypertrophy, diminished very slowly, and the heart did not apparently resume its normal size until December 1, 1901.

A critical review of the first case fails to disclose any condition which might have been a pathologic cause of the dilatation. While at the time of the trouble I entertained some doubt as to the true idiopathic nature of the dilatation, this was removed and my confidence in her perfect health restored by her recovery and subsequent history. The only predisposing element was the lack of robust general muscular development, and the possibly insufficient strength of the cardiac muscle, due to the rather inactive or leisure life led by the patient.

Again in the second case all doubts and suspicions as to antecedent conditions playing the rolé of etiologic factors were dispelled by the complete recovery.

I may say, in passing, that in neither case did I deem it necessary to resort to such additional diagnostic measures as determination of blood pressure, X-ray examination, friction method, etc. The symptoms of dilatation were so coarsely manifested as to render the diagnosis easy and absolute.

The former so generally accepted division of hypertrophy of the heart into concentric, eccentric and simple having been abandoned, we may accept as a fact that all hypertrophies are attended by some dilatation, which may, indeed, be slight, but is constant. Hypertrophy, then, thus associated with some dilatation, probably always preceded by it, because, as claimed by some, a certain degree of distension is necessary to induce hypertrophy, means a morbid anatomic process when it is secondary to either long-con-

tinued or permanent causes, such as enumerated in the first part of the paper. It is superfluous to dwell upon the ensuing dilatation, the nature of which you comprehend, but the sudden appearance of which may in some instances lead to error in diagnosis, as heretofore stated.

The exciting cause in all acute dilatation is an extraordinary physical exertion, producing heart strain—not the muscular exertion involved in continuous efforts, as long marches, arduous labor, etc., but a sudden physical stress, which leads to an extraordinary increase in blood pressure. The determining factor in the process of dilatation is a residuum of blood, which the heart is unable to expel, and which, therefore, causes overdistension of its walls. We can conceive of a simple physical change taking place in the muscle fibres. It is not necessary to refer in detail to the physiologic experiments demonstrating the elasticity of muscle fibres, nor to appeal to the physical law that lengthening means diminution of another diameter—in this instance in thickness—nor to the general law that there is a point beyond which inelastic bodies return to the normal is retarded or impossible.

Why is simple, idiopathic dilatation not more frequently met with? The normal heart possesses, no doubt, great power of accommodation against augmented demands for its work. Occurrences of less intense nature than would produce permanent dilatation are oft repeated in life, and the heart reacts to the moderate exertion by transitory altered increased activity, possibly controled by its nerve mechanism. It is safe to conclude that the healthy heart can overcome a decided transitory excess in physical stress with increased blood pressure, but not without the assumption that the elasticity—say the dilatability—of the heart varies in different individuals, and, within certain limitations, in the same individual. The different degrees of susceptibility of the heart muscle to damaging influences may be congenital or acquired. Although decided differences exist between the skeletal and heart muscles, reacting differently to

chemical and electric stimulation, presenting histologic differences in the arrangements of fibers, etc., still they agree in many ways as to method of growth. It is well known that the heart muscle is strengthened by work, as any other muscle. The healthy growth and development of the heart muscle, depending naturally upon increase in size of muscle fibers, may be said to be a physiologic hypertrophy. Again, because a lack of work is associated with a weak heart we cannot regard such as an atrophic or pathologic heart. In these instances our conception must be largely limited to the view of the quality and not the quantity of cardiac muscle. I dwell upon this as possibly furnishing the predisposing cause of dilatation in the first case.

Now as to the chapter on recovery. I must array myself on the side of those who deny the possibility of recovery being accomplished by such simple process as a return of the power of elasticity, but against those who claim that dilatation means hypertrophy permanent in character. According to the studies of Fick, Horwath and others as to muscular tone, conditions which permit of hypertrophy in any muscle are present in the occurrence of muscular contraction or a stimulus to contract during a state of extension greater than normal. The condition which they postulate is present in dilatation of the walls of the heart with systolic contraction.

In our cases with the hearts still enlarged, but symptoms of stasis and functional disturbances vanishing, we cannot account for the former except by regarding it as an hypertrophy. This is not the slowly developing hypertrophy met with in valvular disease. It is not so much a hyperplasia as a true hypertrophy, an increase in the diameter of the muscle fibers and not so much augmented numbers. It is certainly not a condition in which in the process of destruction and repair there is an invasion of connective tissue, which steels the heart walls but still further impairs its elasticity, and which is never recovered from. The hypertrophy associated with idiopathic dilatation is a condition

which approaches the normal strengthening of muscles—the physiologic hypertrophy.

How can we explain the return to the normal, the *restitutio ad integrum?* In almost all hearts hypertrophied from any cause, examined postmortem, the muscular tissue is found to be the seat of some processes, in part formative, in part progressive. Accepting the view that the condition of a normally strong heart is analogous to the normally strong skeletal muscle, we can carry the analogy further to the consideration of the abnormally strong muscles in either situation. The muscles of the arm of the athlete are assuredly enlarged during training, to assume a normal size after prolonged rest. The growth of the heart wall in simple dilatation soon suffices to overcome the debility due to the primary thinning, and, not required to overcome any obstruction or resistance in the heart or circulation, gradually retrogresses, undergoing involution. On the authority of Fraentzel, it may be stated that if the heart be examined in fatal cases during the early stages after dilatation, hypertrophic alterations are easily detected, but no trace thereof can be found after several months. Hypertrophy of the overstrained muscle, therefore, can retrogress with the cessation of the abnormal resistance to which the ventricular action has been subjected.

As to the treatment, the importance of absolute rest, moderate stimulation and the judicious administration of heart tonics cannot be underestimated. Until compensation is well established no recourse should be had to such plan of treatment as those involving resistance movements, carbonated baths, or massage. These measures may be of benefit in cases in which recovery is delayed on account of malnutrition in general.

The objects of this paper are to add to the literature of the subject the reports of these two unadulterated cases of idiopathic cardiac enlargement, to submit a rational explanation of their occurrence, to furnish assurance for favorable prognosis as to complete recovery, and to furnish data which

may lead to the adoption of prophylactic measures for the prevention of such conditions or their recurrence.

DISCUSSION

Dr H. Lowman, Cleveland: The occurrence of murmurs in connection with dilatation of the right heart is rare, and in this connection I would like to refer in a brief way to a case which came under my observation in which both diastolic and systolic murmurs were heard on the right side. The case occurred in a patient who had made a recovery from typhoid fever. He was doing well and his temperature was normal. Suddenly he was unable to get his breath, and this seemed to be without any especial exciting cause. I examined the patient and found the heart dilated with dulness on the right side and at the same time the appearance of cardiac mumurs which had not been theretofore, a diastolic and systolic murmur. There was no systolic murmur heard at the apex point of maximum impulse. The murmurs were entirely on the right side, the diastolic murmur being heard over the pulmonic area. A thorough examination of the chest disclosed the fact that there was sufficiently large dilatation of the right side of the heart to produce a diastolic murmur in the pulmonic area, and sufficiently strong regurgitation through the tricuspid valve to produce a distinctly audible tricuspid murmur. Murmurs sometimes occur in the right side of the heart so that it is difficult to differentiate them from those occurring at the mitral or aortic valves. In all probability such a thing as idiopathic dilatation of the heart may occur, and when this occurs in the young it behooves us to look for the cause. In young people the causation may be a disease which has not been recognized. I recall three or four cases occurring in young women who on making a slight effort, such as going up a hill, playing golf, tennis, in fact in making any physical effort more than they were ordinarily accustomed to make, were seized with dilatation of the heart, accompanied with murmurs. Subsequent histories of the cases proved that they were the subjects of Basedow's disease. One should always hunt for the causation of this trouble. The physical exercises of young children 10, 12 and 14 years of age should be carefully looked after. We have sometimes dilatation of the heart after bicycle riding. The aorta in many children does not develop as rapidly as the heart and the heart is under a strain due to the narrowness of the aorta, and murmurs appearing in the

region of the aorta will disappear many times after the heart has had time to recover. We have in these cases up to the eleventh, and even the sixteenth year, a persistent murmur, and then it will disappear. There is no doubt at all that acute dilatation occurs in old people.

The treatment which the first gentleman referred to is the one which ordinarily applies. When patients come into the hospital suffering from Bright's disease with mitral insufficiency, with great cyanosis and difficulty with breathing, they are relieved more readily by venesection than with anything else. Venesection will give greater relief in a few hours than will digitalis.

Dr D. S. Hanson, Cleveland: I have been having a case under observation for a long time in which digitalis has a peculiar action. The case is one of mitral insufficiency with dilated heart, marked sclerosis of the arteries with constant albuminuria, enlarged liver and at times more or less edema.

The point I wish to bring out is the effect of digitalis on the heart and circulatory system. One dose daily of digitoxin has been found to act best in this case. When more than one dose is given there seems to be such a marked stimulation to the left ventricle that the right ventricle will dilate and circulation become clogged, liver will enlarge, veins of head become prominent, etc., showing a general venous engorgement. Then if the dose is reduced to one per day his circulation soon improves, liver becomes smaller, respiration better, and there is improvement in every way. Convallaria, strophanthus, cactus, hypodermics of strychnia, etc., have been tried, as well as the various preparations of digitalis (including the infusion), but none answer as well as the digitoxin in the exactly proper dose. We have been able to keep up a fair equilibrium of the circulation for months in this way, only omitting the drug for two or three days at a time every two or three weeks to prevent cumulative effect.

Dr Geo. A. Fackler, Cincinnati: I have only one suggestion to make. I notice that Dr Houser resorted to the liberal use of cathartics. Possibly others have had the same experience as I have, and that is in these cases the selection of calomel is far to be preferred to anything else because of its diuretic effect which is very noticeable in these cases.

Dr Hanson has spoken of the use of digitalis and some disagreeable effects which came from its use and which he attributed to an increase of the blood-pressure. This was

due to the effect of the digitalis upon the terminal blood-vessels. The contraction of the terminal blood-vessels must bring on an increased blood-pressure, which can be overcome by the addition of nitroglycerin, and when given in these conditions will be found to act very nicely.

Carcinomatous Transformation of Ulcer of the Stomach

By John Dudley Dunham, A. B., M. D., Columbus

The possibility of a malignant development in cases of acute or chronic ulcer of the stomach was first suggested by Cruveilhier,[1] in 1835. The coexistence of ulcer and cancer was noted also by Rokitansky,[2] in 1839. The observations made during the past 15 years have been as interesting as they are varied in the conclusions. The extremes of view are shown by Kollmar[3] who says that in an experience of 20 years at the Clinic of Tuebingen he never observed a single case, and by Zenker[4] who holds that every case of cancer of the stomach develops upon a previous ulcer.

The accurate work accomplished by numerous clinicians in all parts of the world would seem to furnish ample evidence that cases of cancerous changes in ulcer of the stomach do occur. The accumulation of thorough reports from such cases will probably show that cancer develops on ulcer more frequently than has been supposed. In 1888, Rosenheim[5] began a series of investigations into cancer of the stomach. He made a large number of histologic examinations from the mucous membrane in cases of cancer, which he found almost uniformly atrophied, whereas, in cases of cancer engrafted upon ulcer, the mucous membrane was intact. Rosenheim reported eight cases of cancer following ulcer, observing each time the increase of hydrochloric acid and the integrity of the mucous membrane. He says: "In cases where the symptoms indicate unquestionable cancer the persistance of free hydrochloric acid shows *a priori* that the cancer has developed upon an ulcer." Waetzoldt[6]

reports a case of clinical ulcer continuing with times of apparent freedom from disease for 28 years, in a woman 48 years old. At this time the hydrochloric acid was 3.7 per 1000. Death followed after a gastroenterostomy. The necropsy revealed an ulcer of the lesser curvature with degeneration of the borders and invasion of neighboring lymphatics with cancer cells. The case of Biach[7] was that of a man of 48 years, who had suffered for a long time with symptoms of hyperchlorhydria. These conditions subsided under rest treatment with medication but recurred from time to time. Finally the patient became cachectic and died of a perforation. The necropsy showed a perforated and degenerated ulcer with stenosis of the pylorus.

The persistence of hyperchlorhydria is illustrated by the case of Eisenlohr.[8] The patient, a male, 49 years of age, suffered for nine years with symptoms of ulcer. Hyperchlorhydria with profuse hemorrhages appeared followed after treatment by period of remission. The patient died cachectic. Free hydrochloric acid had been found present until 10 days before death but was absent three days before death. The section showed an enormous ulcer. The border in the pylorus had become carcinomatous.

D. D. Stewart[9] gives a very complete clinical history with accurate observations upon a case of carcinomatous ulcers of the stomach. The history showed a period of symptoms corresponding to ulcer with hyperchlorhydria followed finally by cachexia. The necropsy revealed two independent carcinomatous ulcers, one near the pylorus and the other near the cardiac orifice in the lesser curvature. The intervening gastric mucosa was perfectly normal histologically which accounted for the continuous presence of hydrochloric acid.

Fuetterer[10] reports several cases, most of which are lacking in complete observations of the clinical conditions previous to the development of the carcinomatous degeneration. He says that the cancerous process usually begins at the lower border of the ulcer, contending that the irritation of the

food bears a pathogenic rolé to the origin of the cancer. Audistere[11] in a Thesis published in Paris gives very complete reports of several cases with histologic studies of the tissues. This monograph gives a fairly complete bibliography to which I am indebted for many references to the literature.

Pathologic Anatomy: An examination into the structure of the stomach from cases of cancerous degeneration of ulcer shows interesting conditions. The ulcer is found at or near the pylorus in more than 50% of the cases. The process of canceration upon ulcer shows only a slight tendency to spread and invade the pylorus. The dilatation of the organ is therefore less frequent. When the disease is well established vomiting of food occurs very soon after its ingestion, which fact no doubt explains the moderate degree of dilatation when present. The base of the ulceration is as a rule made upon one of the neighboring organs. It may be upon the pancreas, the muscular tunic or, if very extensive, in the duodenum. The base is usually smooth and hard as in chronic ulcer. One does not observe the granulation as in simple ulcerated cancer. The canceration begins in the pavement epithelium of the grandular tubules. The edges of the ulcer are significant. They are symmetrically rounded and quite thick. The sides are not marked by the separate coverings of the stomach walls as in simple ulcer. The border is crater-like in appearance. The mucous membrane covering the edges is ulcerated in places and at other points friable. That portion of the stomach not invaded by the cancerous process may present normal conditions. On the other hand the sides of an old noncancerous ulcer may present the same hard and callous appearance from continued inflammatory action. Hence a microscopic examination is sometimes necessary to determine the exact nature of the change.

Diagnosis: The most important phase to the internist and the general practitioner is the diagnosis and prophylaxis of canceration of the stomach. Mayo Robeson, and Moyni-

han, the Mayos, Ochsner, Fuetterer, and others prominent in the surgery of the stomach, believe the irritation from ulcer and healed ulcer defects in the mucosa furnish the starting points of the majority of cancers. These men have an extensive opportunity to observe conditions in the stomach *intra vitam,* hence their conclusions are of great value.

W. J. Mayo[12] says that of 145 cases of cancer of the stomach, which came to operation under them, 60% presented a history of ulcer. Years may have elapsed before the cancerous process began. Two types of the disease are usually noticed. In the majority of cases the indications of ulcer continue until the malignant invasion. This change is accompanied by an aggravation of the pain, which at times is almost intolerable. Vomiting is excited by either liquid or solid food and nausea is not infrequent. Small quantities of blood may be found in the vomit but one rarely meets with profuse hematemesis. The appetite finally fails and complete anorexia results. After a period varying from two to nine months emaciation becomes marked and the anemia is grave.

It is rarely possible to find a tumor. The presence of fragments of growth in the wash water after lavage is occasionally observed, and when present is conclusive. The chemical and microscopic examination of the stomach contents is not characteristic of cancer until quite late in the progress of the disease. The presence of an increase in the hydrochloric acid is usually noted until very near the fatal issue. The fact often misleads in the diagnosis. The limitation of the process prevents the stenosis of the pylorus in many cases. In a second class of cases the ulcer symptoms continue until the end. Profuse hematemesis may occur and perforation is not uncommon. In another class of cases the ulcer symptoms have subsided for months, or perhaps years, and a recurrence of digestive difficulties seems to be a return of the ulcer, which in reality is the beginning of the malignant growth. These conditions are rather diffi-

cult to diagnose. When one has to treat a case of ulcer of the stomach he should bear in mind the grave responsibility resting upon his judgment. Having established the presence of ulcer by the clinical signs, pain and distress in the epigastrium after solid food, pain in the dorsal region, the presence of increased acidity after a test-meal, pyrosis, and possibly hematemesis and melena, he should immediately impress upon the patient or his friends the gravity of the case.

The frequent occurrence of cancer after ulcer, the danger of perforation, perigastric abscess, ulceration extending into the liver or pancreas, perigastric adhesions, hour-glass contractions of the stomach, pyloric stenosis in a large number of cases, is certainly proof positive that we should insist upon the importance of appropriate treatment.

The classic treatment should then be followed—rest in bed with rectal alimentation followed by milk diet over a period of perhaps four weeks. Under such a course of treatment the symptoms may become more marked. There may be loss of weight, increased severity of pain, uncontrolable vomiting. The patient may have paroxysms of pain three or four times a day after food and a progressive anemia and weakness in spite of the rest in bed. It is not usual to have increase of pain in simple ulcer when the patient is upon a milk diet. Under such circumstances with the stomach contents showing increased acidity we may be fairly certain that the diagnosis is canceration of ulcer.

Again, we may observe the case of a patient between 35 and 45 years who, without previous history of gastric difficulty, experiences the symptoms of a severe hyperchlorhydria followed by hematemesis, thus establishing the diagnosis of gastric ulcer.

The proper medical treatment may be instituted but, in spite of it, the symptoms become more severe. A marked anemia develops and the pain is excruciating.

Metastases appear in four, six or possibly after 15 months, followed by death from some complication of the ulcer or as a result of the cancerous growth.

Hayem[13] says cancerized ulcer is the most severe of all gastric affections.

The treatment of this condition is entirely surgical. The performance of gastrectomy or a gastroenterostomy offers a curative or palliative relief in proportion to the success in establishing an early diagnosis.

Prophylaxis: Proper treatment medically of simple ulcer in its first manifestations is a preventive measure which physicians should rigidly enforce.

The recommendation of gastroenterostomy performed by a skilful surgeon in cases of intractable chronic ulcer is another means which should be employed to prevent the possibility of cancer development.

Treatment of a recurrence of digestive disturbances after a history of ulcer with apparent recovery should be carried forward without any loss of time. Surgical interference is successful only when resorted to early in cases of development of cancer upon ulcer.

Conclusions: Cases of carcinomatous transformation of ulcer of the stomach are probably more frequent than is currently believed. They may be treated along surgical lines with a reasonable hope of prolongation of life and along medical lines merely in a palliative manner.

REFERENCES

1. 1885—Cruveilhier—Path. Anatomy Human Body.
2. 1889—Rokitansky—Perforating Ulcer of the Stomach. *Oesterr. Med. Jahrb.* T. XVIII.
3. 1890—Kollmar—*Berliner Klin. Wochensch.*, No. 5.
4. 1882—Zenker—*Berliner Klin. Wochensch.*
5. 1888—Rosenheim—*Berliner Klin. Wochensch.*, No. 51, p. 1021.
6. 1889—Waetzoldt—Cancer of Stomach Developed on Ulcer. *Charite Annalen.*
7. 1890—Biach—Development of Cancer of Stomach on round Ulcer *Wiener Med. Presse*, March 30.
8. Eisenlohr—A case of Round Ulcer terminating in Cancer. *Deutsche Med. Wochensch.*, No. 52.
9. Stewart—*Am. Journ. Med. Sciences*, Nov. 1898.
10. Fuetterer—*Journ. Am. Med. Ass'n*, Vol. 38, 1902.
11. Audistere—Thesis Paris, 1903.
12. W. J. Mayo—*Annals of Surgery*, March, 1904.
13. Hayem—*Presse Medicale*, No. 88, p. 249; No. 98, p. 317.

DISCUSSION

Dr John H. J. Upham, Columbus: I merely wish to speak of two points in connection with this paper. First as to the value of this contribution to the literature of the subject; while the condition has been more or less studied, and it has frequently been demonstrated at autopsy that cancer does follow ulceration, the literature is scanty, and therefore I think the clear account which the Doctor has given us is of great value and should elicit considerable interest.

Secondly, in regard to the prophylaxis in these cases, if I may so use that term, Dr Dunham has covered the ground, but there is one point that I wish to emphasize, and that is the early advisability of calling in surgical opinion as to a possible operation. Anyone who has once been the victim of ulcer is always liable to a recurrence, because the conditions that brought about the first ulcer can readily occur again in that individual, and the site of the first ulcer, consisting as it does of connective tissue, is less resistant and may even more readily break down and become again the site of ulceration. I remember such a case occurring in the practice of Dr Hamilton, of Columbus, in which the patient 10 years before had been admitted to the hospital suffering with the typical symptoms of gastric ulcer; when I saw her upon her second admission to the same hospital, she had evidently the same condition. There was a high degree of hyperacidity and a large amount of connective-tissue fragments in the vomitus which from its character could only have come from the breaking down of the old cicatrix. Unquestionably this may occur repeatedly in the same individual, and such a one may be almost considered in the same light as a person who has had catarrhal appendicitis; for while they may pass safely through several attacks, the presence of such a condition is a constant menace, and may give rise to serious danger at any time.

When, therefore, we have a case of gastric ulcer that is rather unusually obstinate, not yielding to the ordinary medical treatment, or tending to recur, it is our duty, in the light of our present knowledge, to at least call in surgical counsel and consider the advisability of operation. Early exploratory section may in uncertain cases be of the greatest possible value.

Dr N. R. Coleman, Columbus: I only desire to speak a few words in reference to Dr Dunham's excellent paper. My

belief is, that the majority of cancers of the stomach are preceded by ulceration. My observations have extended over a good many years of general practice and of a hospital service, and during many years as a teacher I have taught this. I then believed that this view was correct, and now I am more than ever firmly convinced that the majority of cases of cancer are preceded by ulceration. As stated by the essayist, when you have what would seemingly be a second or third recurrence of ulceration the probabilities are that you have the commencing stage of cancer.

I wish to state that I do not believe milk is the proper diet in these cases. I am confident that my patients do not do well on a milk diet, and I have abandoned its use in ulceration of the stomach, as I have in typhoid fever. In my opinion, milk is not a fit article of diet in these two diseases.

Dr John Dudley Dunham, Columbus, closing discussion: I simply wish to say a few words in reference to diet. It has been my custom in these cases to use milk as a routine diet with rest in bed. It has only been in the last few days that I have seen a case in the practice of Dr Hamilton which could not tolerate milk. The patient suffered agony when milk was administered to her, but on light soups she did very well. Perhaps with a larger number of cases one might find more patients of this sort.

Gastrectasia, Its Clinical Significance and Treatment

By D. B. Conklin, M. D., Dayton

Gastrectasia is that degree of motor insufficiency in which there is a permanent enlargement of the stomach with retention of its contents.

Clinicians differ widely as to the precise place in nosology to which gastrectasia should be assigned. While some, high in authority, consider it a disease *per se,* others, perhaps a majority, consider it merely an incident in a weakened gastric musculature dependent upon varied local and constitutional causes. Whichever view may be correct, and much can be said in support of both contentions, the symp-

tom-complex and clinical history of a typical gastrectasia are so marked and characteristic as to justify its separate discussion.

Cases of gastrectasia naturally fall into two groups: First, the obstructive or secondary form dependent upon a more or less complete stenosis of the pyloric opening. Constriction of the pylorus by adhesions, cicatrices, benign or malignant growths either within or without the stomach, gall-stones and kindred lesions are responsible for the larger number of grave cases which come to the notice of the practitioner, and are therefore of great practical importance.

For obvious reasons, we shall confine our remarks to the second group in which the dilatation depends not upon a mechanical impediment to the passing of the gastric contents into the duodenum, but largely, if not wholly, to the hypotonicity of the gastric muscles, so-called gastric myasthenia (Boas) or ischochymia (Einhorn).

The acute form of gastrectasia due to muscular paralysis or spasm of the pylorus is rare, though not so rare as was taught by the older authors. This condition is usually due to gross excesses in eating and drinking acting upon a stomach already weakened by previous disease of a local or general nature and thereby predisposed to sudden dilatation. Boas and Riegel note the frequent occurrence of atony of the stomach in cholelithiasis, in heart and kidney lesions and in the later stages of the cachexias. Hereditary taint and errors in feeding during infancy figure prominently in the causation of both the acute and chronic forms.

Acute dilatation often passes away promptly with the passing of its temporary cause, but it may have a fatal termination as in the cases of Hunter and A. Frankel, and not infrequently lapses into chronic ectasy to the consideration of which we now pass.

In the chronic, as in the acute form, overloading of the stomach with indigestible foods and drinks holds the first place among the etiologic factors. The first effect of such unhygienic living is to produce a simple enlargement—

megalogastria—which under the baneful influence of a gastritis, nervous dyspepsia or hyperacidity, finally leads to degeneration of the muscular fibers, to dilatation and retention. Once started the vicious circle readily perpetuates itself. Fresh food is constantly added to the stagnant mass already in the stomach, gases are generated by fermentative processes, the walls of the stomach become thinned and inelastic and sag, more and more, under the weight of the retained ingesta until, in extreme cases, the fundus touches the rim of the pelvis.

The stomach not infrequently contains an immense quantity of fluid. In a case now under treatment there was drawn from the stomach at the first examination over a gallon of vile smelling, putrefying material, and yet the patient was goading himself to the management of a large manufactory.

The syndrome of symptoms which makes up the clinical picture of gastrectasia is not distinctive, and the diagnosis could rarely be made without direct investigation of the motor powers and capacity of the stomach. The symptoms proper are always modified by those of the diseases which bear a causal or complicating relation to it. Evidences of disturbed digestion are uniformly present and later emaciation and autointoxication manifest themselves. Thirst, which leads to immoderate drinking, is a distressing feature and is due to the small amount of fluid which passes the pylorus. To this same fact may be attributed the small quantity of urine voided and, in part, the ever-present constipation.

The quantity of feces discharged in 24 hours furnishes a rough index to the amount of material which is forced through the pylorus in the same period. In extreme cases the feces may be reduced to one-fifth the normal amount.

Vomiting is perhaps the most characteristic symptom. The attacks of emesis, separated by variable intervals, are preceded by abdominal distension and distress, ofter occur at night, and rarely at the maximum of digestion. They

exercise a safety-valve action on the over-distended stomach and invariably bring temporary relief, depending upon the thoroughness with which the undigested and fermenting material is removed.

Pyrosis and the eructation of gases are rarely absent. Riegel makes the statement that gaseous fermentation may be regarded as a positive sign of motor insufficiency, or better, of abnormal stagnation of stomach contents. These gases are usually foul smelling and occasionally are inflammable. The patient to whom reference has been made, on one occasion burned his nose and mustache by eructating when in the act of lighting a cigar.

Tetany is a rare but interesting symptom which is met with in a small proportion of cases. The attack commonly follows severe vomiting, or less frequently the use of the stomach-tube. Since Kussmaul (1869) pointed out the association of tetany with gastric dilatation and retention, numerous theories have been advanced in explanation. The consensus of opinion favors the theory of autointoxication but the special toxin has not been isolated. It is worthy of note that postmortem and operative examinations show that tetany occurs with greater frequency when the pyloric narrowing is due to a benign cause like the cicatrization of an ulcer in the stomach or duodenum than when it is due to malignant growths.

If the knowledge gleaned from the study of symptoms in gastrectasia is vague and uncertain, that which comes from direct interrogation of the stomach by modern methods is positive and reliable. In severe ectasy with retention, inspection and palpation will enable one to outline the enlarged and flabby organ and thus suggest a provisional diagnosis which may be verified by other means. Auscultatory percussion, as practiced by Benedict, gives valuable data, especially if the results obtained in the erect and prone positions are compared. Distending the stomach with air and the colon with water suffices to differentiate the sounds coming from these viscera.

Authorities are not agreed as to the estimate to be placed upon the presence of succussion sounds. Although Elsner's latest investigations show that distinct splashing can, not infrequently, be elicited in normal stomachs, yet when constantly present, under slight pressure, it certainly does furnish strong confirmatory evidence of a loss of power in the walls of the stomach.

Transillumination with Einhorn's gastrodiaphane, measurement with Hemmeter's intragastric rubber bag, exploration with Turck's gastric sound and the X-ray are all valuable agents, especially when safe-guarded by other means of examination, in determining the contour and capacity of the stomach, and also in differentiating mere prolapse or ptosis from dilatation. To avoid error it must be kept in mind that a simple enlargement of the stomach predisposes to both gastroptosis and gastrectasia, and, in fact, these conditions are not infrequently present at the same time.

Some practitioners still estimate the motility of the stomach by Ewald's salol test, especially as modified by Huber, but it is unreliable and in the presence of better methods should be discarded.

This brings us to the consideration of lavage and the test-meal which, under all circumstances, is the court of highest appeal. The normal stomach should empty itself in six or seven hours after a test supper, and the failure to do so indicates a degree of motor insufficiency proportionate to the amount of food which can be recovered by the stomach-tube. The presence of a considerable quantity of undigested material in the stomach before breakfast is considered by Hemmeter and others to be pathognomonic of gastrectasia. Remnants of the evening meal may be retained in the stomach over night in chronic gastritis and in some acute disorders, and hence that degree of motor insufficiency indicative of gastrectasia can only be assumed when the quantity remaining is large and constant. In the severer forms the quantitv may be enormous as in the case pre-

viously quoted. It is generally thick and pasty, contains remnants of the meals of many preceding days, is often intensely offensive and requires repeated washings for its removal.

The chemic and microscopic examination of the ingesta, which varies in quantity, in composition and decomposition with the degree of insufficiency, is often strongly suggestive of the cause of the retention. Hydrochloric acid usually in excess may be diminished or absent, and when absent, especially in the presence of lactic acid, atonic gastrectasia must be differentiated from the malignant form of the disease. Occasionally small fragments of the stomach mucosa will be found in the wash water, which under the microscope may show the characteristic structure of cancer.

Having proved the existence of gastrectasia, we are confronted with the important question of prognosis. Lack of time prevents full discussion of this phase of the subject. Suffice it to say, that the prognosis depends entirely upon the ability to remove the cause of the impediment to the passing of chyme, whether it be a mechanical obstruction of benign or malignant nature, or defective tonicity of the gastric muscles.

In obstructive gastrectasia, especially if the narrowing of the pylorus is due to neoplasms, either in the stomach or neighboring parts, little can be done by medication save in palliation. The only recourse is to surgery. A pylorectomy or a gastroenterostomy offers the patient, in all instances, a chance for comfort and the prolongation of life, and for a permanent cure should the obstruction prove benign in nature.

The atonic form of gastrectasia with which we have chiefly dealt in this paper, although an intractable disease, is more amenable to remedial measures. The objects to be attained by treatment, in a general way, are to regulate the diet, to prevent retention and fermentation of the ingesta and to improve the muscular tone and power of the stomach.

The question of feeding is all-important, not only in the daily management of a given case, but also in the matter of prophylaxis. When one recalls the large percentage of cases which follow in the wake of other diseases, especially the infections, one cannot fail to be impressed with the necessity of carefully guarding the diet of every convalescent until the stomach has fully regained its normal tone.

It is commonly recommended that the food in gastrectasia should consist largely of semisolids or fluids given in small amounts at frequent intervals. Mering and Moritz have shown that fluids remain longer in the stomach when taken with solids than when taken alone. Van Swieten goes so far as to recommend as far as possible a dry diet. Turck, in a recent article, has departed from the established custom and advocates the giving of larger meals at long intervals. He holds that the presence of food in the stomach excites motility, and that the small and frequent meal not only deprives the stomach of needed rest, but fails to stimulate the atonic organ sufficiently to cause it to expell its contents. Since reading this article I have had an opportunity of testing this method in one case and repeatedly found less food in the stomach after a full dinner than after an Ewald test-breakfast. In each case the stomach was emptied eight hours after taking food. Before dismissing the subject of diet let me emphasize the good that will come from the patient adopting the rule of lying down after each meal, and preferably on the right side, which position mechanically favors the emptying of the stomach.

In those cases in which sufficient fluid for the body needs does not pass the pylorus, rectal injections of normal salt solution will promptly relieve the thirst which is a source of so much discomfort. Nutrient enemata serve a useful purpose not only in tiding over emergencies, but also at different periods in the treatment to give the stomach rest.

Lavage and electricity undoubtedly hold the first place among therapeutic measures. All cases will be benefited by lavage but, in the severer grades, its use once or twice daily

is imperative. Riegel prefers the hour before supper for washing so as to secure a full night's rest for both patient and stomach. Others select the early morning, before breakfast, on the plea that the entire night is thus secured for the preparation and passage of the chyme into the duodenum. When fermentation of the withdrawn material is marked it is advisable to add some antiseptic drug like salycilic acid or lysol to the wash water. This condition also calls for the internal administration of antifermentative remedies like resorcin, subgallate of bismuth and beta naphthol.

Either electric current may be used, but the faradic is most commonly employed and may be applied through the abdominal walls or directly to the gastric mucous membrane. My experience is limited to intragastric faradization using for this purpose Einhorn's improved electrode. In an exceptionally severe case, now convalescent, electricity was given almost daily for over four months. The sittings were each 10 minutes in duration and the strength of the current was just sufficient to cause strong contractions of the abdominal muscles.

Strychnin is indicated, not only for its local effect on the stomach, but as a tonic to the nervous system. On account of its action on unstriped muscular tissue Hare combines it with the tincture or extract of physostigma. Hydrochloric acid should always be prescribed when analysis shows its decrease or absence.

The giving of drugs by the mouth except to meet special indications is not advisable, and from the fact that absorption is so irregular and uncertain it is safer, when practical, to administer them subcutaneously or by the rectum.

As subsidiary measures, we may mention massage and an abdominal bandage. An experienced masseur can sometimes cause a largely dilated and overful stomach to promptly empty itself. The constant wearing of a snugly fitting binder will add to the comfort of the patient and give support to the stomach and abdominal walls.

In the milder and more recent cases of gastrectasia a cure may be confidently expected, provided the patient will adhere closely to the restrictions imposed. Relapses are frequent, due oftentimes to the neglect of some detail of diet or hygiene. A certain proportion of those who suffer from the severer grades of gastrectasia are permanently invalided notwithstanding the utmost care in living and the most judicious treatment. It would seem wise in these cases to advise one of the several operations designed to lessen the size and improve the drainage of the stomach.

The brilliant results which have followed the recently improved technic in gastric surgery will undoubtedly make the adoption of operative procedures in atonic gastrectasia more common in the future than in the past. The necessary operative measures even in "last resort" cases give a surprisingly low mortality. Mayo Robson's record is 101 gastro-enterostomies with a death-rate of 3.9%, and 20 cases of pyloroplasty without a fatal result. In 168 cases of gastro-enterostomy made by Mayo 157 recovered and 11 died, a mortality of 6.5%.

Habit

By C. D. Mills, M. D., Marysville

Perhaps I should ask your indulgence for embracing in this paper some things that might be considered more appropriate before an organization purely ethical in function. As the years go by we are appreciating more and more the interrelation of the physical and the moral, and some of the intricate problems touching primarily the individual; secondarily, our social and civic life must be referred to our profession for correct solution, and we now understand, as never before, that it is often true that vicious habits, vile tempers, and brutal passions are neither vicious, vile nor brutal, and are not exorcised by fasting and prayer, but that they are manifestations of disease and demand the attention of the physician.

Habit, in its generic sense, means to have or possess, whence its definition dress, condition, temperament, mode of living, individual characteristics of any kind, and has come to embrace the tendency or aptitude for the performance of certain actions acquired by custom or by a frequent repetition of the same act. James, of Harvard, says that the laws of nature are nothing but the immutable habits which the different elementary sorts of matter follow in their action and reaction upon each other. Another defines habit as "Paths of association, predisposition, vestiges, traces left in the brain by past experience."

Habits are either natural or acquired. I think we will find this a division of convenience rather than of cause, and that natural and acquired habits are more closely related than only cursory attention would lead us to believe. Natural habits are those which we have by inheritance. We probably do things the first time in such and such a manner because they are the easiest things for us to do; the sensory impulses following the paths of least resistance, and subsequent acts become more and more determined and automatic with each repetition, all of which is fundamentally true of acquired habits; habit formation, in either instance, is based upon the law that the nervous system tends to form itself in accordance with the mode in which it is habitually exercised.

The habits of the simpler material forms are definite and unchangeable. Hydrogen and oxygen in proper atomic proportions always form water. We can predict with definiteness what iron and an acid in combination will produce before the combination is made, but with more complex material associations, the habit phenomena are more complex, and, beginning with the lowest organic forms to the climax of organized matter as we have it in man, we have a greater and still greater number of indeterminate acts. Vegetable life presents a more complex material form than unorganized matter and consequently less determinate habit phenomena. The rose and the lily present for our

delectation an endless variety in color, form and fragrance, and then we arise to the dignity of animal life in which habit is instinct, and then to the plastic material human organization, in which a great number of the habit phenomena are distinctly possibilities. Using the terminology of Mercier, the conduct of the self with the notself furnishes as great a variety of results as there are variations in the molecular composition of each individual self.

The ability of acquiring habits is in proportion to the plasticity of the organic materials of which our bodies are composed, and the special characteristic of plasticity has its most perfect example in the nervous system. Some parts of the nervous system seem to be so definitely organized that each sensory impulse gives an invariable motor phenomena. The nervous control over the vegetative functions is such that, in states of health, they execute their work in a uniform manner for three score years and 10, but incident motion in the cerebral areas yields decidedly indeterminate results, the plasticity making it possible to mould it this way or that, for weal or for woe.

We do things for no other reason than that we have done the same thing before. A young friend of mine, who is at present a teacher in a mission school in Persia, when a pupil in our high school, was accustomed to rising early and putting on some working clothes and employing himself an hour in his flower garden, after which he would return to his room and dress himself for school. On one occasion he repaired to his room after his morning's work, undressed himself and, being of a devout nature, followed his evening custom, kneeling down to pray, and went to bed again. The act was, of course, entirely automatic, being the accustomed sequence of undressing. Upon entering my home each evening, it has become my duty to lock the door at which I enter; now, it is a very common thing for me to turn the key in the door at any hour of the day that I enter the house by way of that particular door. We repeat ourselves each day in the manner of walking, eating,

dressing, even to the minutest detail (James). The laborer, mechanic, and the professional man take on mannerisms that are inseperable parts of themselves. Habit binds us with bands of steel to our life work. The man of 30 can almost never change his occupation without disastrous results. Habit adapts us to our sphere and makes us satisfied with it. A page in a current number of *Harper's Weekly* aptly illustrates this, although not intended for the purpose. The representation is a street scene in New York City near Delmonico's; it is the noon hour and a number of laborers in appropriate garb are sitting on the curbing eating from tin pails their plain fare, and they have every appearance of being genuinely happy. At a window over their heads, wealth and fashion, in costly raiment, fared sumptuously, and their faces were wreathed with smiles and expressions of gaiety. A transfer of either crowd to the opposite position would have rendered either most miserable. Habit had adapted them to their particular spheres and had kept them satisfied with them.

"Man is born with a tendency to do many more things than he has ready-made arrangements for in his nerve centers" (James). Heredity determines these tendencies, and environment what these new arrangements shall be.

Many, probably most, of the new mechanisms are fixed in early life. It is well known that this is the susceptible period. The middle factor in the sensory-thought-will arc is not well developed, or not developed at all; that is, there is but a slight, or no modification of the sensory impulses, and as a consequence, the emission motion corresponds wholly with the afferent impulse. The child accepts unreservedly the suggestions of its parents and friends, because it has no fund of experience that enables it to compare these statements with others previously received and fixed in the nervous system in the form of memory. During this period of growth and reconstruction, during this period when it is eminently true that the nervous system forms itself in accordance with the mode in which it is habitually exercised,

it is of vital importance that the child's training should be most thoughtfully and conscientiously directed. The home laws should be as habitual and unchangeable as the laws of nature. The child should never be aware that a difference of judgment between father and mother is even a remote possibility. Truth should have a parental personification. It is not so important that the child be taught the laws of habit, as that the home and school government should be inflexibly executed in accordance with those laws. The home should see to it that all the simpler acts and ethical problems of life are made habitual, in order that they may be removed from the category of things requiring conscious attention, before the time when their offspring is confronted by life's sterner responsibilities. What a calamity to themselves and society that children are sent out into the world with no definite habits but those of indecision, like a rudderless craft on a wild sea, unstable, unresisting, helpless, useless—all because their early training has not built their nervous systems into bulwarks of defense. In securing the anamnesis of our habit cases which cover the ground of occupation, social condition, degree of education, religion, general health, and habit heredity, we have for the past three years sought to know something definite about their early home life as to matter of government, and I have not been surprised to learn that a large number of these unfortunates have never known the practical meaning of the word law. Either there had been no discipline at all, or infractions of law were met with no condemnation today and with unreasonable arraignment and punishment tomorrow. It seems unfortunate that the home that furnishes this conflicting, unstable and vacillating environment should bequeath nervous systems peculiarly susceptible to the acquirement of just such qualities.

Touching further the matter of inheritance as a causative factor, it is true of narcomania, as it is true of all other nervous diseases, that it is not always, and is in fact infrequently, preceded by either alcoholism or drug addiction in

the parents or more remote ancestry, but is usually the sequence of some other form of neurosis. The following illustrative case is given somewhat in detail on account of its unusual interest, and it incidentally conforms to the statement of Norman Kerr, which is confirmed by Crothers, that a large number of narcomaniacs are liberally educated. Dr X., aged 34, native of New York, English ancestry. The family history, so far as obtainable, reveals no example of drink or drug addiction. His father is of an intensely nervous temperament, thoroughly educated, a recluse who lived apart from his family and devoted his hours of retirement to study of philosophy; he knew only one opinion and that his own, and any one daring an encounter of words was met with no consideration; he knew nothing, and cared less, for the business world; in short, he was the embodiment of peculiarities and eccentricities. The mother, a beautiful character, with lofty ideals somewhat impracticable, had an unstable nervous mechanism. There were no sisters. There was one brother who developed a mild form of melancholia at the adolescent period. Our patient was most versatile in his abilities and acquirements; a graduate in medicine, an expert chemist, in which capacity he was employed by one of the large industries of this country, an art critic, learned in the philosophies, a nonprofessional violinist of unusual merit, socially a Chesterfield, and an inebriate. At 20 he was his brother's attendant at an Adirondack health resort, mentally and physically fatigued by the cares and responsibilities of the day; one evening he heard some hunters telling how greatly they were refreshed by the drinking of an egg-nog. This was a sufficient suggestion for him to take his first drink. The experiment was more than pleasing to his unstable nervous system; it was the satisfying of a ready-made craving for sedation. With the exception of a period of two years which followed his treatment, he went on from bad to worse—the last few years using morphin with the hope of obtaining the oblivion which alcohol would no longer secure for him. If living, he is today a vagabond

on the streets of an eastern city. Inheritance had established channels of least resistance in his nervous system that rendered it altogether improbable that the sensation produced by his first and subsequent indulgences should follow any other course.

Prof. Bain's maxims on the "Moral Habits" are reproduced by James in his Psychology as follows: First: "That in the acquisition of a new habit, or the leaving off of an old one, we must take care to launch ourselves with as strong and decided an initiative as possible." The second maxim is: "Never suffer an exception to occur till the new habit is securely rooted in your life," to which Prof. James adds a third and fourth as follows: "Seize the first possible opportunity to act on every resolution you make and on every emotional prompting you may experience in the direction of the habits you aspire to gain, and keep the faculty of effort alive by a little gratuitous exercise every day." Epictetus had the same thought 1800 years ago, when he said: "In general, if you would make yourself skillful, do it, and if you would refrain from anything, then do it not, but use yourself to do rather some other thing instead."

These maxims should have practical application by us in our routine work as physicians, particularly in our chronic cases, in which, of course, the habit element is a more important factor. We frequently do not get the results that are easily within our reach, because we fail to appreciate the habit element in our cases, the train of symptoms that have a tendency to continue indefinitely for no other reason than that they have once begun. In those of unstable nervous organizations, an insignificant cause results in establishing mechanisms of sensation and thought and will that seem to have no power of self-limitation. A like result follows a more serious pathology in one who has a strong and well-developed nervous system, especially if the cause has been active for a continued period. In this class of cases we will gain time and satisfactory results by practically applying the first maxim, that is, by attacking our cases with as

strong an initiative as possible, forcibly cutting short the symptom complex by the use of such vigorous medication, or surgical measures, in conjunction with positive suggestion, as will profoundly impress the entire organism, rapidly modifying the blood stream, and starting new paths of molecular activity.

At this point I venture the opinion that we have overworked the small dose frequently-repeated idea, and that there are not many acute cases, and very few chronic ones, in which the method is applicable. A vigorous onslaught upon the bulwark of disease with 10 grains of mild chlorid or two ounces of castor oil impresses the patient that something is being done and has abundant advantages as an initial treatment over one-tenth grain given often, however well triturated with sugar of milk.

A spring shower falling upon the thirsty earth, the water follows the deepest and most pervious channels washed out by previous rains; so, until our nervous channels are made deep and wide by being repeatedly and continuously occupied by the new ideas and new sensations that our treatment has instituted, any freshet of adverse suggestion or the intercurrence of some insignificant causative factor will incline the brain current into the old channel. So we must guard our patient against extraneous influences that will render possible an exception to occur until the new habit of sensation and thought is securely fixed. Then we should encourage our patients to act upon the new view-point which we have aided them to occupy; that is, encourage them to think, and think repeatedly, the thoughts of recovery and health we have suggested, until the idea health has become habitual, and thereby rob Dowieism and similar fakes of their only element of strength, the exceedingly useful influence of suggestion.

These maxims are essentially important in the management and treatment of the drink and drug habits. The vigorous attack is important. The successful way to quit the habit is to *quit!* The starting upon a new line of action

is well begun when a strong initiative is made. In accordance with this thought, the immediate or rapid withdrawal of opium is infinitely better than the reduction and extension method, or any other method with which I am familiar. Weeks and months, however, are necessary to increase the patient's power of resistance to such a degree that he is able to stand firm against temptations, such as illnesses, attended with what would be to an ordinary individual insignificant suffering, periods of mental depression that memory tells him the drug will overcome, imaginary social injuries, products of a hyperesthetic nature and a defective judgment, and many other creations of a vivid imagination that are certain to be in his pathway.

The temporary removal of the desire and necessity for stimulation or narcotism does not constitute a cure any more than the reduction of a fracture and the application of appropriate dressings is a cure, based upon the correction of deformity and freedom from pain. From our case records I select the following:

Miss K., aged 29, was admitted August, 1902, a neurotic history embracing several cases of alcoholism; her father has an abundance of money to which she has had free access; her own wishes have been unstintingly granted from her earliest childhood. She experienced some distress at the inauguration of the menstrual function at the age of 15, for which she asked relief, and laudanum was given her. From that time, she has used opium in some form, soon acquiring the use of the hypodermic needle, using from five to 20 grains of morphin *per diem*. A habit of 14 years duration begun at the time when nature's demands upon the vital forces are extremely exacting, and continued with few interruptions throughout the years of early womanhood. Fourteen years without a normal sensation; 14 years of abnormal cellular activity; 14 years of distorted function; 14 years, during which new nervous mechanisms have been outlined in conformity with unreal sensations and depraved ideals. She has very little natural and no acquired self-control. Every sentiment of altruism she ever possessed has been crucified on the cross of selfishness. After three days of active elimination, the drug was at once withdrawn.

At the end of 14 weeks she was not altogether normal, but was sufficiently improved so that we felt justfied in discharging her and entrusting her to her own keeping.

This is a fair representation of the average morphin *habitue.* Now, gentlemen, in the presence of these facts, what is your judgment of the two to seven day cures and their endorsement by reputable physicians? Alcoholism requires the same general management, but the time of professional surveillance is not necessarily so long.

DISCUSSION

Dr D. W. Shumaker, New Bedford: The contents of this paper certainly bring to our minds something which concerns us all very much as general practitioners. It is a pretty hard thing to determine where to draw the line between a habit that is normal, and one that is abnormal. As stated by the essayist, it is true that we all have certain habits. They are born with us or otherwise acquired. To tell just where a normal habit ceases to be so is sometimes difficult. The Doctor has laid down certain plans of treatment for the alcohol and morphin habits, etc., and I believe a number of these plans are applicable to those unfortunate sufferers. This is certainly a paper which should be thoroughly discussed.

Dr C. J. Lewis, Chicago, Ill.: I wish to say in regard to this paper that it is one that we certainly need to consider with care. It is not an easy matter to know why it is that a nerve impulse, passing along its path and going to a certain muscle, induces it to contract, and in the absence of that nerve energy it will not contract. Equally difficult is it to determine why it is that certain foods will induce a certain craving, or a certain fluid a certain craving, or yet a certain medicine a certain craving, but we know that this does occur, and it should be the duty as well as the wish of the physician to ascertain as nearly as possible why these habits are formed by the tissues. I take it to be the writer's position (possibly I am mistaken) that our thoughts are produced from certain impulses, or that a certain something enters at the special sense nerves or sensory tips of our nervous system and in this way gets into the nervous mechanism and becomes a nerve impulse, and, should we direct the sense organs toward

certain objects, we are more apt to receive impulses for nerve energy from them than by turning our backs to them. Hence, if we are in the habit of looking toward the saloon, or at a morphin bottle or the hypodermic charged with morphin, the impressions received travel along the lines of least resistance, that is, the energy pushes along that line, and we get more of that impulse than any other, and in this way the tissues become accustomed to these impulses and influences and acquire a habit for the things observed.

I think the advice of the Doctor in counselling a longer time than is usually held to be necessary for the recovery from the habit of this kind is certainly good. We certainly cannot take on a new habit immediately, and it requires time to recover from one that has been formed. I have never been addicted to the use of alcohol or tobacco in any way, but I remember well in 1847 when my father, who had been both a chewer and a smoker up to this time, stopped both at once. It was at harvest time, and he did not take either during the remaining 36 years of his life. He determined that he would not take either again and forced a change of habit, a change that is not over-common.

Dr G. H. Colville, Circleville: This paper certainly appeals to every physician in the surroundings of his home. Habit is the test of character. Character is formed in infancy and the physician is sometimes responsible for the awful influences and awful effects of habit that may be acquired in infancy, in young manhood or womanhood. No doubt the habit in the case referred to was begun at the time of the little trouble in the menstrual function at the commencement of womanhood, and it was something that might have been averted; a suggestion from her medical attendant might have averted it even after it had really begun, but in time that habit became a disease. It was not a physical disease, but a pervertion of the functions of the nervous system so that abnormal thoughts were secreted as it were by the nerve-cells, and that caused her to assume that she could not get along without this drug. These are things over which the physician has quite a control, and they should be taught in our common and high schools. The Doctor spoke of his own habit of turning the door key—that is habit and not a disease. I do not think that we could consider anything that was formed along that line as being of a diseased character, and yet it shows the very easy way in which the nervous sys-

tem may become impressed, and that continuing along certain lines may result disastrously to the human being.

Dr L. G. Leland, Newton Falls: I have been in the habit of looking at this subject from a different standpoint. Habits can be classified under two headings, one class of which comprises the moral and mental, of which the essayist has given us an accurate account, and the other is that which is produced by the use of drugs. The second class, it seems to me, should be investigated from the standpoint of immunity. It is well understood and put to a practical and successful test in the case of infection by the branch bacillus of diphtheria, that the toxins evolved by the growth of the germ produce an effect upon the cells of the economy which stimulate them to the production of an antitoxin, which perfectly neutralizes these poisons and even goes so far as to kill the germ itself. So also is it with each of the pathogenic infections, otherwise we must die each time infected. A higher and more scientific appreciation of the condition of the habitue may be obtained by applying the same principle to his condition.

A person after using morphin, alcohol, chloral, tobacco or cocain, etc., for an indefinite period awakens the cells of the economy to the production of an anti-body which exactly neutralizes the effect of the primary poison, which is persistently turned into the blood current. Now suddenly withhold the accustomed dose, and the patient, for a patient he is, soon finds himself suffering from an autointoxication, which in some cases is *capable of producing death,* and which is relieved only by the administration of the special primary poison. The habit in this instance is one of cell, and is a perversion of the natural method of self preservation. There is a great difference between the moral and mental habits, and the habit of drugs; a great difference between the ceasing of swearing and the use of alcohol, etc. I personally would not be in favor of the sudden withdrawal of an accustomed dose, but would think that the gradual reduction of dose would be a much safer plan.

Dr D. R. Silver, Sidney: I would like to have the Doctor in his closing remarks advert to one point which he made and give us some further light, if he can. I, myself, have not treated many cases such as he refers to, morphin users and alcoholics, but I have had several under observation. I recall one case, a young man, a practicing physician who had

gotten into the habit of using morphin, and he became very strongly addicted to its use, so much so that he had to withdraw from his profession. His wife came into my office to consult me about her husband, and I said more in the way of encouragement than anything else, "Why don't you pen him up." Nothing more was said about the matter. She left the office, went home, and in a few weeks came back and said she had penned him up, but was afraid the man was going to die. I made some further inquiry about the matter, and I found she had taken my advice literally, which was not given in a professional way, and had penned him in a room upstairs. He developed some very severe symptoms, but I thought sufficient time had then elapsed so that he would not die and I encouraged her to keep him penned up, and in the course of probably a week or two more he came to himself, and after a little further treatment he was quite restored. I simply assumed at the time his wife visited me that the proper way to treat such a case was to keep him from his accustomed doses. Afterward a young man and also a young woman came under my care for this same habit and I took them to a sanitarium and found the method of treatment there quite different. They were not kept secluded.

The drug was taken away so gradually that the patients did not feel they were being robbed of their stimulants all at once. The question in my mind then was which is the better method of procedure. Of course, it is to be expected that Doctors will differ in their methods of treatment, but I should like to have the matter discussed in such a way as to give us more light on this subject than we can acquire by mere observation of a few cases which may come under our care.

Dr C. D. Mills, Marysville, closing discussion: There are several things which I would like to say but I will refrain for lack of time. I tried faithfully the reduction and extension plan of treatment for about seven years, and to my absolute disgust I found that while you could keep patients comparatively comfortable during the period of reduction and extension, you invariably had a fight when it came to the taking away of the last fraction of a grain of morphin. During the past three years, after a brief period of rapid elimination by way of the alimentary tract, kidneys and skin, the drug is at once withdrawn. There is one thing to remember in dealing with those patients and that is never to

believe anything they tell you with reference to their habit unless you know it is true. You must take nothing for granted with a morphin user. The patient is placed under the care of a nurse day and night. We use hyoscene or duboisia, keeping our patients under the influence of these drugs for possibly two or three days after the morphin is withdrawn. They are then allowed to come out from under their influence, when they are placed upon supportive treatment. In the course of a short time they are perfectly comfortable. The physical suffering is never great. It is chiefly mental suffering. One physician made a distinction between habits, separating them into moral and the ordinary so-called drug habits. What I tried to impress in my paper was that the same fundamental law is operative in both instances. Morphinism is a pure neurosis, there being no pathologic changes following even its prolonged use (Norman Kerr). It is the thinking, thinking, thinking of the constant quietude and sedation they had obtained from the use of opium that tempts them to relapse. It is very much easier to withdraw alcohol from the alcoholic cases, in fact they are very simple cases to manage—in a very few weeks they are able to be self-supporting and take care of themselves; but that they will continue to behave themselves is another proposition, depending upon the individual patient's mental and moral characteristics inherited and acquired. The man who forms the habit of taking a social drink and then feels the need of a little something more each succeeding day until the habit of drink grows on him—such cases are much more simple and easy to handle, and they are also more apt to remain sober all their lives after treatment than the so-called narcomaniac.

Some Therapeutic Needs

By J. C. Larkin, M. D., Hillsboro

It is not the intent or purpose of this paper to discuss in minute detail any one or several particular drugs, but to call the attention of the general practitioner to some of the tendencies and growing evils of the times.

A valued medical friend of mine, now long since retired from practice, remarked to me one day in my office that now the practice of medicine was easy as compared to the

conditions when he began. "Why," he says, "everything is prepared ready for dispensing. When I began to practice we had only a few things to select from; now you have everything. It's pie compared to the time when I began." This may seem true, but I beg to take issue with my esteemed friend. It appears to me now to know what not to dispense.

We do not mean to infer that there is not accurate and definite prescribing, for we cannot help but admire the accuracy with which some of our well-known specialists and well-informed general men, who have access to a good pharmacist, take definite therapeutic aim.

The druggist of today is not a pharmacist or an apothecary, but a merchant interested in the sale of his wares and the making of a profit. He is not interested in the welfare of humanity nearly so much as he is in his pocketbook. He is neither a philanthropist or humanitarian; he is a tradesman. This you will find whether in the city or country. Herein much of the trouble lies. Some years ago our Homeopathic friends brought out their system of minute dilution and frequent dosing. They furnished their own preparations and did their own dispensing. Their preparations did not cost much because one did not get much but a quantity of sugar, and it pleased the children, and in this lies their advantage. People went to the disciples of Hahnemann, received the advice sought and a vial of pills, all for the price paid either the druggist or regular physician. It pleased the people and we have all, in a measure, been led to follow suit. The country practitioner, of course, was compelled to carry a stock of drugs. Today the doctors, outside of the specialists, and a few men of renown, in cities and larger towns, dispense all, or a part of their medicines, out of their offices. I am told that even many of our well-known men in the city are carrying a stock of drugs in their offices.

Outside of a few of the larger cities the doctor either keeps the drugs or goes to the drug-store and has the prescription put up and gives it to the patient.

From the present indications, I believe that in 10 or 15 years, unless a change takes place, the physician's relations with the druggist will be severed and our old-time friend of mortar and pestle will be confined to extoling the virtues of patent medicines, tooth brushes and perfumery. The manufacturers of pharmaceutics are already making overtures in this direction.

The representative of a well-known house has already made this assertion to me. The question is, are we building better or worse? Are we, as physicians, to become both prescriber and dispenser, and if this be the case, who will be the gainer, the phyician or the patient, or either? Are we to become druggers or dreggers, or are we to become purveyors of pills, powders and potions?

It has been asserted by the profession that the druggist could not be prevented from substitution, and in many instances he would do the prescribing, especially when some profitable patent preparation could be substituted. I do not charge that substitution is a universal practice, in fact, I believe it is the exception, but the interest of the two is not the same.

The druggists are organized and ever alert to their own interests. I have but to recall to mind the "Crawford Bill," which came up before the last session of our legislature and was overwhelmingly defeated.

In the *Journal of A. M. A.* of March 19, 1904, I note two editorials, one on "Druggist Ethics" and one on "Auto-Dispensing," and from the tone of these I am led to believe that the custom of dispensing has come to stay. While we note the pendulum swinging from one extreme to the other, and time only can tell what the outcome will be in the next few years. In Great Britain it is largely the practice of physicians to dispense their own preparations, and some men with large practices have a special man to do their dis-

pensing. In France there is a law preventing physicians from dispensing, but it is very unsatisfactory and its advantages are not so many as its disadvantages. In some states there has been attempted legislation to prevent autodispensing. The ultimate result of such law would be to send many patients to the prescribing druggists and ultimately increase the use of patent and advertised proprietary remedies.

The druggists' windows and show cases are always covered with signs and advertisements of quack nostrums that are guaranteed to do anything under the sun. The worst of all this is the majority of these preparations contain a bad quality of red liquor or alcohol. We cannot so much wonder at this when we know of the immense fortunes made in a few years by judicious means of printer's ink. What does it mean? We stop and think that there is $2 spent for every man, woman and child in the United States each year for the purchase of such stuff, and at a price much greater than that obtained by the average doctor for an excellent pharmaceutic preparation intelligently prescribed.

We cannot wonder that the druggist and patent medicine men can put up dollars to cheap politicians when we doctors could raise pennies, to get a special bill lobbied through or prevent a rotten farce being practiced on an unsuspecting and gullible public. They say, "The Public Be Durned."

While we note with pity and compassion the passing of our old apothecary friend we are confronted with a greater and graver additional responsibility, that of selecting pure drugs and chemicals for our patients.

When we scan the advertising pages of our medical journals and look over the tons of advertising matter that yearly comes to our hands, I fear we have, indeed, a grave responsibility when we have our reputations at stake and our patients' lives in our hands. To be able to select what is best from this incomprehensible mass is a question almost

as great as the building of the Panama Canal. Shall we confine ourselves strictly to prescriptions, preparations, drugs and combinations of drugs laid down in the dispensatory and pharmacopeia, or shall we choose from the mass of chemical and pharmaceutic preparations presented to the profession?

There is not a day but that the United States mail brings to our desks reports of preparations, combinations and chemicals from men with titles to their names a yard long of the number of cures and no failures that Prof. So and So of Blank Medical College has had and the brilliant results obtained.

Now how in the name of common sense is the average busy practitioner going to know about these things? He is anxious and ever ready to serve his patient to the best of his ability. He does not want to appear old fogyish. No one can deny but that some of these preparations may have some excellent virtues. It is impossible for one mind to know it all, even of therapeutics.

I fear the *art* of prescribing is lost. If there is one thing in which we general practitioners are more deficient it is in prescribing for our patients, both as to what and the methods and manner.

To begin with, I will venture the assertion that one-fourth of the drugs and preparations on the shelves of the offices of the doctors of Ohio today are worthless, inert and inactive. That the doctor is not absolutely sure whether the preparations contain so much to the ounce or to the dram, or whether he knows how much or what they do contain. The smiling and agreeable individual with the pink necktie who does the prescribing for him is careful to leave it off or leave it vague in the mind of the doctor. Now, if you don't believe it is true, honestly ask yourself or the other fellow, or look when you go home. The smart Alecs who do your prescribing for your patients tell you what beautiful and elegant preparations and how *cheap*. Their house puts out only the best and cheapest. I am going to ask my

brother who dispenses, and I am one of them, if this is not the case that grave evils are most constantly arising.

Again, it seems to be fashionable to make radical changes. Fads are constantly with us and are either going or coming. A few years ago pepsin preparations were prescribed for every kind of gastric disorder, and every possible kind of preparation was put on the market. Now but little is used and dispensed, and then only as a vehicle. We know that albuminous indigestion forms but a small part of gastric disorders.

This brings up the important question, that of "accurate diagnosis," and herein lies our true science and skill. The day of guessing is past, or should be, at least. Our work is more by the rule and square and not differentiation. Our scientific teachers and writers are daily placing within our reach accurate and absolute methods of diagnosis, and we have less excuse for going astray.

How deeply are we impressed with the truth of that old Arabian Proverb which says:

"A man who knows not, and knows not that he knows not, is a fool—shun him. The man who knows not, and knows that he knows not, is simple—instruct him. A man who knows, and knows that he knows, is wise—follow him."

It is unfortunate that patients are not able to make these distinctions in selecting physicians.

The spirit of commercialism has so invaded our profession of late years that there is no telling when it will cease. The man with the commercial spirit is the man who gets the business and not the man with brains and ability.

In a community of any considerable extent you will find an exceptionally well-qualfied ethical and professional man who is compelled to sit in his office and watch some clap-trap of an ignoramus scoop in the business and gather in the sheckels and listen with chagrin at the other fellow's supposed prowess and great powers which are mostly talk. Many capable men have been compelled to

starve or commit suicide or worse, go to quacking for these very reasons.

There is a large body of men whose methods and means are those of the quack and charlatan, and who are prospering under the cloak of regular profession. To these I would recommend to the various societies the administration of large doses of active purgatives that would rid the profession and ultimately the practice of such infectious material. Heroic cases sometimes require heroic doses. They are not alone in the smaller societies, but in many of our larger organizations. Their names and faces, like fools' names and faces, are often seen in public places. It is amusing, but sad, to see the manner of some of these so-called celebrities and hear them bray when they strike some rural community. They never lose an opportunity to "butt in" to some large medical meeting with an array of statistics. Their long and strong suit is gall, and to impress the country doctor with their prowess and gain cheap notoriety.

What we, as general practitioners, need is a clearer and better understanding of the physiologic action and accurate dosage of the agents we employ. We read in our books and journals of the results obtained by teachers and writers of some new preparation or the new use of some old preparation and are led to employ it in a certain case at hand in which the diagnosis and conditions are supposed to be the same. We are led to give it a trial. How often do we hear the expression, "Give it a trial"? Are we all experimenters and do we know? Is our boasted advancement in scientific knowledge still open to trial? How many of our teachers and text writers agree on all their finer points of our most common pharmaceutics? Is it not a truth that many men have had to spend 10 to 15 years in finding out for themselves what would do the best work? Do we not constantly see the therapeutic methods of the most eminent men assailed by men equally eminent?

Take the most common diseases, typhoid fever and pneumonia. You can, on one hand, easily prove that drugs

exert no influence on the disease and often do more harm than good, and especially when injudiciously prescribed. On the other hand, you will hear of men who have specifics or claim they have, and that none of their cases die. Prof. Osler said at a medical meeting in the east a short time ago that the tendency was away from drugs, and he is possibly more nearly right; but how long would a physician be employed to treat a disease if he did not administer drugs? About the third day they would look queerly at him and tell him his services would be dispensed with and a drugger would be sent for.

Drugs are constantly prescribed by regular physicians in about the same manner that patent medicines are sold and used, and with as little definite ideas. Yet if I may be allowed I will quote from the preface of Professor H. C. Wood's Therapeutics, Its Principles and Practices, in which he says: "In various attempts at original research, as well as in the ward and lecture-room of the hospital, I have keenly felt the want of something more."

The old and tried method in therapeutics is that of empiricism, or, if the term sounds harsh, of clinical experience. What is believed today is tomorrow cast aside, certainly has been the law of advancement and seemingly must continue to be so. What has clinical therapeutics established permanently and indisputably? Scarcely anything beyond the primary facts that quinin will arrest an intermittent, that salts will purge and that opium will quiet pain and lull to sleep. Experience is said to be the mother of wisdom. Verily she has been in medicine rather a blind leader of the blind; and the history of medical progress is a history of men groping in the darkness, finding seeming germs of truth, one after another, only in a few minutes to cast each back to the vast heap of forgotten baubles that in their day had been mistaken for virtues. In the past, there is scarcely a conceivable absurdity that men have not tested by experience and for a time found to be the thing desired. Since the profession has toiled so long and found

so little, if further progress is to be made, we must question the old methods and search out new ones, which, happily, may lead to more fruitful fields. In the ordinary affairs and business of life when anything is to be accomplished the effort always is to discover what is to be done, and then what are the means at command. A primary knowledge of the end to be accomplished and a secondary acquaintance with the instruments are a necessity for successful human effort; and until the sway of the law is acknowledged by physicians, medicine can never rise from the position of an empirical art to the dignity of applied science." In the face of this, is it any wonder that we who are the handmaids of medical science often cry out in despair at our helpless condition? The mission of the general practician is not as a scientific investigator, but as one who relieves pain and suffering, heals the sick and tells the truth.

I quote again from H. A. Hare's Practical Therapeutics, under General Therapeutics Consideration, a little more optimistic view, in which he says: "Two very foolish and unfounded ideas have been put forward by certain physicians, one being that medical therapeutics is useless, and the other that this branch of medical knowledge is not advancing with so great a stride as is pathology or surgery." The individuals who laugh at the general use of drugs in disease belong to one or two classes, either they have never tried them, or, if so, have used the drugs ignorantly or wrongly, or else they believe they are promulgating a new theory and do not know that the eras of excessive dosage and of nihilism are alike relics of the past. No reform has ever attacked a crying evil without becoming excessive and absurd itself, and if successful in accomplishing its object has generally resulted, not in the mere remedy of the faults it antagonized, but in so complete a reversal of popular opinion as to force its converts into ways as reprehensible as their former habits.

Among the newer preparations placed on the market today, there is not one possessing merit but what has been

imitated and copied. The name is changed and we are often led to believe we are dealing with something new when it is only some old and time-tried preparation with a new and high-sounding, and too often misleading, name. I have often been puzzled to know where they get all these names. A casual glance through any medical journal will reveal this. Some of these advertisements are very amusing indeed. If I may be pardoned I will mention a few. A widely known preparation, manufactured in St. Louis, that carried advertisements in almost every journal in the country, is illustrated with a man, possibly intended for a doctor, dressed in the prevailing style of "Ye Olden Times," carrying an umbrella in a violent down pouring of rain. He is holding the umbrella over the tablets advertised for what reason I can never imagine, probably to keep them from dissolving.

Another represents a healthy young child grasped in the bony hands of a skeleton and bearing the inscription, "Croup Kills." Still another advertisement represents a vaginal sphenoid. A healthy son of toil was trying to drive one of the sphenoids into a log with a maul. These advertisements were found in some of the most scientific medical publications whose editors would laugh to scorn any practitioner who would deign to prescribe such preparations.

Dr William J. Robinson in *Journal of A. M. A.* of April 16, 1904, in an excellent article, calls attention to the "Composition of Some So-Called Synthetic and Ethical Nostrums." He mentions some of the antipyretics, migrain preparations and their multiplicity of sin; hemaboloids (?), which was illustrated with the most beautiful charts showing the various blood conditions and changes, and was claimed to be a palatable fluid food partially digested and made aseptic, and warranted to be rich in nucleoalbumin (Nature's supply of iron) reinforced by bone marrow extract and beef peptones. A careful analysis disclosed an alkalin 1% solution of iron peptonate in a vehicle of alcohol, glycerin and water flavored with spirit of orange.

Think of how the poor patients would feel if they knew the antikamnia which cost 30 cents per pound, and they were paying $16 per pound for it. Think of the gold they were paying for ordinary iron.

He gives the composition of a number, as follows:—

Antikamnia: Acetanilid, sodium bicarbonate and caffein.

Salfene: Acetanilid and sodium bicarbonate.

Phenolid: Acetanilid and sodium salicylate.

Febralgen: Acetanilid and sodium bicarbonate.

Phenbromate: Acetanilid and potassium bromid.

Phenalgin: Acetanilid, ammonium carbonate, sodium bicarbonate, caffein.

Phenamid: Acetanilid and sodium bicarbonate.

"Hydrargotin" is a fancy name for mercury tannate.

"Dymal" is didymium salicylate.

"Montanin" is zinc sulphite.

"Chrysolein" is sodium fluorid. "Remarcol" is the same thing.

"Tachiol" is silver fluorid.

"Horit" or "Gorit" is calcium peroxid.

"Calcinol" is calcium iodate.

"Biogen" is magnesium peroxid.

"Musol" is a fake diabetic remedy, which is nothing but salol.

"Anodynone" is a trade name for ethyl chlorid.

"Antimorphin" is a solution of sodium phosphate.

"Katharol," "Lazon" and "Oxydol" are fancy names for a solution of peroxid of hydrogen.

"Intestin" is bismuth-naphthalin benzoate.

"Parietin" is chrysophanic acid.

"Rachitol" is an imbecile name for suprarenal gland in tablet form.

Then we have thialion, respiton, neurilla, Dad's quinin pills, emissine, appendicine, gynecine, manola, sanmetto, ecthol, seng, chionia, chaparine, zarcol, labordine, resinol, lymph-compound, neurosine, eulexine, pinaedol, celerina, veronal, respiton, ferridine, anasarcine, satyria, urieseptine,

pas-avena, zarcol, rheumagon, fitchmul, tono-sumbul, ergoapiol, bioplasm, ammonol, lithalkin, zematol, sulphogen, cystogen, hydrozone, glycozone, empyroform, endermol, uriform, tonzaline, kudros, gonosan, etc., etc., *ad infinitum.*

Life is too short to even name them all. It would drive one to insanity to investigate even a part of them. That these things are employed by physicians no one can doubt. The advertisements appear week after week and month after month. That patients and physicians are duped out of their good money in many instances is an axiom. That some of these things have some merit and therapeutic value *may be.* Patients sometimes recover from acute and chronic diseases without any medicine or without knowing that they were diseased. Could Macbeth have been blamed nor could he now be blamed for exclaiming, "Throw physic to the dogs; I'll none of it."

Who is to blame? Everybody. Teachers, partially, but not wholly. After our medical education is completed we start into practice with the knowledge of one man, the teacher, and the authorized text-book. In practice we sometimes find this inadequate. In after years, if we progress, we gain knowledge from journals in which we get the experience of many men. It does not always agree. Doubt arises in our minds and chaos ensues.

The journals are to blame in publishing and constantly keeping before the eyes of the physicians unethical preparations.

The doctors are to blame for prescribing remedies, the composition and physiologic action they know not of.

THE REMEDY AND CONCLUSIONS.

An important step has been taken by Senator W. B. Hepburn, who introduced a bill into the United States Senate providing for the preventing the adulteration of food and drugs. Like all other laws this will need the united cooperation of the profession in every county society to make it effective. It should be the duty of every physician to see that this law is passed and obeyed. No more import-

ant bill has come before Congress in years than this because it grants to that body the power to provide for the "general welfare" of the people.

The public, in general, is every ready and alert to see that their financial interests (lands and houses, stocks and bonds) are not molested, but pay but little heed to their health or things pertaining thereto.

Governments usually take care of those defectives who are not able to take care of themselves, and in keeping with this the bill provides a protection for the people against frauds, shams and deceptions which are daily practiced in commercial life.

Another favorable sign of the times was shown when the University of Chicago conferred Honorary Degrees on Prof. Paul Ehrlich, Director of the Royal Institute for Experimental Therapy of Frankfurt-am-Main.

The United States Government should have established at Washington an Institute for Experimental Therapy or chairs in the leading medical universities throughout the country. Such investigations would, in time, help to raise therapeutics from mere empiricism to a degree of scientific accuracy. It would carry the stamp of approval, at least.

Last and most of all, it should be the conscientious duty of every physician to scientifically study more carefully every case entrusted to his care; to study more carefully his therapeutic agents. Mauser bullets are more effective than charge from a blunder-buss; to employ only the best and purest drugs and of whose physiologic action he can feel reasonably certain; to prescribe drugs manufactured by concerns in whose honesty and integrity there can be no question; to teach his patients that indiscriminate drugging with patent medicines leads to incurable evils; to endeavor to raise the practice of medicine to a standard that will inspire confidence in the masses as well as the classes.

The question of autodispensing, its advantages and disadvantages, I leave to the kindly consideration of those who may see fit to discuss this paper.

DISCUSSION

Dr C. D. Mills, Marysville: I would like to say just one word. I think we should consider very carefully this matter of prescribing things when we have no idea as to what the remedy contains. I was very much impressed with what the essayist stated about the analysis of these various proprietary preparations. During the last year I read in the *Journal of Inebriety* the analysis of many of the so-called reconstructive food remedies, and it was found that these contained from 20 to 40% of alcohol and had no food value whatever, and when our patients take these things they are losing the advantage of milk and eggs which have a known food value, substituting for them these worthless preparations. If we are going to give alcohol let us give it, and know how much we are giving.

CHAPTER IV—SURGERY

Treatment (*a*) of Diffuse Suppurative Peritonitis Following Appendicitis; (*b*) of Intestinal Obstruction Following Laparotomy

By Dudley P. Allen, M. D., Cleveland

It would almost seem that an apology were demanded in presenting to this Association anything upon the subject of appendicitis, since it has received such extended consideration during the few years past. I shall venture, however, to trespass upon your patience for the few minutes necessary to present one phase of the subject.

Operations upon cases of general peritonitis, the pus being confined by no limiting adhesions, but being distributed throughout the entire abdominal cavity, have been extremely fatal, so fatal in fact that eminent surgeons have questioned the veracity of any one who has claimed to have rescued from death such cases by operation. Notwithstanding the fact that one may be subjected to the criticism of either inaccurate observation or incorrect statement, I desire to present to you the history of the last eight cases of the sort described which have been operated upon by myself at Lakeside Hospital. Of the eight cases, three have died and five have recovered. A tabulated report of the cases, prepared by my First Resident, Dr Sanford, is appended to this paper, so that it is unnecessary to enter upon too much detail.

The essential points at issue alone need be considered. All of the cases were in a most critical condition, bordering on collapse; several were delirious. In most of the cases

the abdomen was markedly distended, tympanitic, and universally tender. The symptoms were, in fact, of a degree of severity which made them appear almost hopeless. Recovery without operation was impossible, so far as surgical judgment can go.

The question of lavage of the stomach, the withholding of everything by mouth, and the elevation of the shoulders, as suggested by Ochsner, seemed inapplicable on account of the grave condition of the patients upon admission to the Hospital. Such patients, if not operated upon quickly, die of toxemia. If operated upon they commonly die either from the inadequate removal of septic material, or from the shock incident either to prolonged operation or to the replacing of distended intestines which have escaped from the abdominal wound during operation and cleansing of the abdominal cavity.

Although somewhat varying methods have been employed in the cases reported, as may be seen by studying the table experience in these and other cases leads me to recommend a method which I have come to believe the most efficient. A lateral incision low down in the iliac fossa is the most desirable. Its advantages are, first, that it gives direct access to the cecum, so that it can usually be seized and drawn at once into the incision; second, by turning the patient immediately o the right side, drainage is downward; third, with his left and the operator may at the same time that he prevents the cape of the distended gut, hold the tissues away from the tbe used in irrigation, so that perfectly free exit is given tohe water. A tube of hard rubber or glass of nearly one-ha inch caliber, and long enough to reach from the incision to ne most distant part of the abdomen, is used for washingand a rubber tube attaches to this a funnel into which wat is poured at a height of from three to four feet above the ıtient, so that the water enters the abdomen with force and i large volume. Thus, if the incision in the abdominal wall l held well open, the water escapes from the abdomen as rapıly as it enters. The dependent position of the open-

ing also facilitates its rapid escape. When the washing has been thoroughly accomplished, every part of the abdomen having been cleansed, two large glass drainage tubes are inserted into the pelvis and one into the right flank. Wicks are placed in these to aid drainage, and the patient is placed in bed, turned well to his right side. Thus the drainage is facilitated by gravity. In washing, the normal salt solution is employed by preference, though sterile water has often been used with seemingly as good results.

Gauze is packed into the abdominal opening around the drainage tubes to prevent the escape of intestines, and also to facilitate drainage. The essential factors in the operation are, first, a dependent opening through the abdominal wall which facilitates washing and drainage. This is secured by turning the patient on the side; second, speed in operating so as to prevent shock; third, thorough washing by means of a funnel held high above the table, the funnel being inserted into a large rubber tube, having a nozzle 12 to 14 inches long, so that it may be carried to every part of the abdomen; fourth, the prevention of the escape of intestines by the operator's hand, while the free escape of water is at the same time insured by keeping the incision open and the intestines back from the tube; fifth, the greater ease with which the intestines are restrained from escaping from the incision. The intestines, being distended by gas, have a great tendency to escape from an incision, especially if it be above, whereas with the patient turned to the side with a dependent incision this tendency is decreased; sixth, the avoidance of shock so frequently met with in returning to the abdomen intestines which have escaped during the process of cleansing of the abdominal cavity.

In insisting upon the value of the method described, I do not lose sight of the tendency of inflammatory products to localize themselves in the dependent part of the abdominal cavity, by the employment of gastric lavage to empty the alimentary tract by elevating the patient's shoulders and by quieting peristalsis. This paper seeks to emphasize the fact that there is a class of cases in which the inflammatory process is so far advanced and so widely distributed that

without immediate relief death is sure to follow speedily. Even in the advanced state of collapse, in which these cases are found, a considerable portion may be saved by immediate and radical measures such as are described. The eight consecutive cases presented were all of them in such grave condition that any less radical method would, in the opinion of the author, have proved speedily and surely fatal. I am convinced that the adantages of a low lateral incision, both for rapid operating and for thorough washing and subsequent drainage, are very great.

In this connection a second procedure of value in cases otherwise fatal is worthy of mention. In laparotomy, from whatever cause, if extensive inflammation be present, adhesions may cause intestinal obstruction. In suitable cases a secondary laparotomy may enable the operator to relieve the obstruction. In grave cases the shock of the secondary opening of the abdomen usually proves fatal. In these cases if a loop of distended gut be seized, drawn into the incision, opened and drained, the symptoms of obstruction may be immediately relieved. The advantage of an opening in the intestine as low as possible is apparent. A portion of such openings in the gut close themselves. Should they fail to do so they may be closed by operation after the patient has gained sufficiently in general condition to withstand operation.

Three cases only are presented for the purpose of illustration. The method has been adopted as occasion required for more than five years, and has been employed not only as a secondary procedure, but also as a primary one. It has demonstrated that great distention may exist without general inflammation and without the wide distribution of pus. In cases of obstruction independent of or subsequent to laparotomy associated with great distention and a state of collapse, such as to preclude all hope of the successful removal of the obstruction, by laparotomy the quick formation of a fecal fistula may give relief and rescue a patient from impending death. The two distinct procedures presented will, in my opinion, save a sufficient number of cases, otherwise hopeless, to warrant their adoption in the relatively small proportion of cases of the sort which occur.

Enterostomy for Post-operative Intestinal Obstruction

Surgical Number	Name	Age	Condition	Original operation	Indications for secondary operation	Operation	Convalescence	Result
4353	M. R.	42	M.	Appendectomy with drainage for appendix abscess. Two glass drainage tubes and iodoform gauze.	Obstinate distension after operation. Unsatisfactory bowel movement on the 1st and 3rd days. Good movements on 5th day, poor results on 6th and 7th days. Enemata and catharsis given freely. Glass tubes removed 3rd day. Gauze on 5th, 6th and 7th days. Midnight 7th day persistent vomiting of greenish foul smelling fluid began with increasing distension, visible peristalsis, rising pulse and temp. Cyanosis.	8th day coil of small intestine brought up into original wound. Glass rod passed through mesentery, walling off gauze placed, gut opened. Glass flange tube secured by silk purse string. Large amount of foul liquid feces escaped with great relief to the distension. Patient in profound shock. Pulse 150. Very poor condition, requiring the most vigorous stimulation, infusion, etc.	Immediate relief to obstruction, but convalescence was slow, at times interrupted by a kink in the gut just behind the colostomy, which caused backing up of feces, requiring catheterization of bowel. Severe grade of acetonuria was a prominent symptom. Apparently greatly relieved by enormous doses of sodium bicarbonate (3i every 2 hours.)	Discharged improved 63 days after the enterostomy, with a small fecal fistula. Patient reported four months after leaving hospital. Fistula still remains, but she has gained flesh and strength and is comparatively much improved. She will return later, for closure of fistula.
4436	G. B.	21	S.	Appendectomy with drainage of localized abscess. One glass drainage tube. Three strips iodoform gauze.	Small bowel movements with enemata on 2nd, 3rd and 4th days. Hiccoughing and vomiting began to be persistent on 3rd day, with increasing distension. Frequent gastric lavage.	5th day coil of ileum brought up into wound and walled off with gauze. Gut opened and a flange tube tied in with silk purse string. Large amount of liquid feces escaped.	Vomiting and hiccoughing relieved at once. Great restlessness and delirium for several days, made restraint necessary; otherwise rapid recovery.	Discharged improved 51 days after secondary operation, with a fecal fistula, which discharged only slightly, greater portion being passed by rectum. His physician reports (five months after operation) that the fistula is still open. Fistula successfully closed by secondary operation May 11th, 1904.

Surgical Number	Name	Age	Condition	Original operation	Indications for secondary operation	Operation	Convalescence	Result
4516	M. A.	26	S.	Double salpingectomy and left ovariotomy, for tubercular salpingitis. Wound closed tight.	Slight distension day after operation, greatly increased 2nd day. Great pain, rising pulse, from 100 to 140. Hiccoughs persistent, enemata ineffectual. Temperature subnormal. Gastric lavage gave a large amount of greenish, black fluid. All symptoms increasing in severity.	2nd day omentum found adherent to sigmoid. Lateral incision over cecum which was brought up and opened, followed by escape of gas, but no feces. This considered inefficient and loop small intestine brought up into median wound and opened. Flange tubes sewed into both openings. Second opening drained well. Patient in profound shock. Vigorous stimulation with intravenous infusion.	Immediate relief of symptoms. Attempt to close both fistulæ on 26th day, followed in 24 hours by distension, intense pain, hiccoughs, rapid, weak pulse. Fistula in median line reopened with abatement of symptoms. Fistula in cecum remained closed, and did not require reopening. Convalescence after this slow, but steady.	Discharged improved 66 days after first operation, with fecal fistula. Patient returned two months after leaving hospital for closure of fistula. This was successfully done by resecting a portion of gut and she was discharged cured with a solid abdominal scar 29 days after operation.

Laparotomy and Lavage for Diffuse Suppurative Peritonitis

Surgical Number	Name	Age	Condition	Occupation	History Present Illness	Physical Examination on Admission	Operation	Convalescence and Result	Cultures
2610	W. B.	19	S.	Waiter.	Severe abdominal pain for 48 hours, increasing in severity. Vomited 2nd day. No chills. Bowels had not moved for three days. First attack of the sort.	Tem. 99.6°. Pulse 110. R. 24. W. B. C. 12,000. Abdomen greatly distended, rigid, tympanitic, everywhere tender, especially over recti. No local dulness.	Immediate operation. Median incision. Free pus throughout abdomen. Intestines distended, congested. Light fibrinous adhesions, appendix gangrenous, perforated—removed. Intestines removed from abdomen, washed with saline and replaced. Two glass drainage tubes.	Convalescence uneventful. Bowels moved 2nd day. Drainage tubes out 8th day. Discharged cured 31st day.	Bacillus coli communis.
2857	H. G.	21	S.	Foreman.	42nd day after laparotomy and drainage of appendix abscess (appendix not having been found) as patient was about to go home supposedly cured, sudden severe epigastric pain, vomiting, symptoms rapidly increased in severity for 12 hours. Distension, fever.	Tem. 101°; Pulse 140. R. 24. W. B. C. 20,000. Abdomen distended, everywhere tender, more especially on right side. No localized dulness.	Median incision. Free pus in abdomen. Intestines injected and inflamed. Adhesions in right iliac fossa, causing kink in gut. Appendix gangrenous, perforated behind cecum—removed. Lavage of abdomen with saline. Mikulicz tampon. Two glass drainage tubes.	Bowels moved 2nd day Considerable vomiting for three days. 1st tube out first day, 2nd on third day, tampon on10th day. Discharged cured 39th day.	Bacillus coli communis.
3038	H. F.	20	S.	Machinist.	Five days before entrance sudden abdominal pain, general for two days, then localized in right iliac fossa, later general again. Vomited several times first two days. Bowels moved with cathartics up to 4th day.	Tem. 101°. Pulse 120. R. 20. In marked state of shock. Abdomen distended, rigid, board-like; everywhere tympanitic and tender to pressure. No localized dulness or special point of tenderness.	Immediate operation. Incision through right rectus. Free pus on opening peritoneum. Intestines injected and flaked with fibrin. Appendix gangrenous, perforated—removed. Lavage with saline. Gauze and two glass drainage tubes.	Did not rally from operation. Death in six hours. Discharged dead. (No autopsy.)	Bacillus mucosus capsulatus. Streptococcus pyogenes.

Surgical Number	Name	Age	Condition	Occupation	History Present Illness	Physical Examination on Admission	Operation	Convalescence and Result	Cultures
3536	T. B.	35	M.	Paper-hanger	Four days before entrance severe pain umbilical region, which became general, persistent and increasing in severity. Vomiting steadily for four days, at first food, later brown stinking material. No movement for four days. No chills. Slight fever. Great discomfort from distension. Tender on pressure.	Tem. 100° Pulse 105. R. 26. Marked degree of surgical collapse. Abdomen distended and tense, tympanitic; everywhere tender, especially about region of cecum.	Immediate operation, preceded by gastric lavage. Median incision, pus free in abdomen. Appendix gangrenous, perforated—removed. Intestines distended, injected, covered with clots fibrin. Lavage of intestines which were removed from abdominal cavity and replaced. Adhesion in one coil of intestine had produced kink and obstruction. Iodoform gauze. Two glass drainage tubes.	Did not recover from shock of obstruction which preceded the operation. Vomiting continued. Bowels moved only slightly. Strong stimulation, gastric lavage and enemata were inefficient. Enterostomy done 48 hours after operation. Discharged dead two days post op. (No autopsy.)	Bacillus coli communis.
3844	P. M.	13	S.	School boy.	36 hours before entrance sudden pain in region of cecum, with tenderness. First attack. In 24 hours pain became general, followed by distension and persistent vomiting. Tem. 103.5°. Pulse 160. No chill. Bowels did not move since attack.	Tem. 99.6°. Pulse 140. R. 35. In marked state of collapse. Abdomen greatly distended, tense, tympanitic, tender to pressure everywhere. No special point of local tenderness. No localized dulness.	Immediate operation. Median incision, free pus found, incision closed. 2nd incision over cecum. Appendix gangrenous, perforated—removed. Intestines injected, covered with flakes fibrin. Pus thin, yellowish color, fecal odor, large amount free in pelvis. Lavage abdomen with sterile water. Two glass drainage tubes, with iodoform gauze.	Drainage tubes removed by patient 1st day after operation. Gauze packing replaced. Convalescence otherwise uneventful. Wound entirely closed on 37th day. Discharged cured.	Culture was sterile, though cover-slip showed many pus-cells and bacilli.

Laparotomy and Lavage for Diffuse Suppurative Peritonitis

Surgical Number	Name	Age	Condition	Occupation	History Present Illness	Physical Examination on Admission	Operation	Convalescence and Result	Cultures
2610	W. B.	19	S.	Waiter.	Severe abdominal pain for 48 hours, increasing in severity. Vomited 2nd day. No chills. Bowels had not moved for three days. First attack of the sort.	Tem. 99.6°. Pulse 110. R. 24. W. B. C. 12,000. Abdomen greatly distended, rigid, tympanitic, everywhere tender, especially over recti. No local dulness.	Immediate operation. Median incision. Free pus throughout abdomen. Intestines distended, congested. Light fibrinous adhesions, appendix gangrenous, perforated—removed. Intestines removed from abdomen, washed with saline and replaced. Two glass drainage tubes.	Convalescence uneventful. Bowels moved 2nd day. Drainage tubes out 8th day. Discharged cured 31st day.	Bacillus coli communis.
2857	H. G.	21	S.	Foreman.	42nd day after laparotomy and drainage of appendix abscess (appendix not having been found) as patient was about to go home supposedly cured, sudden severe epigastric pain, vomiting, symptoms rapidly increased in severity for 12 hours. Distension, fever.	Tem. 101°; Pulse 140. R. 24. W. B. C. 20,000. Abdomen distended, everywhere tender, more especially on right side. No localized dulness.	Median incision. Free pus in abdomen. Intestines injected and inflamed. Adhesions in right iliac fossa, causing kink in gut. Appendix gangrenous, perforated behind cecum—removed. Lavage of abdomen with saline. Mikulicz tampon. Two glass drainage tubes.	Bowels moved 2nd day. Considerable vomiting for three days. 1st tube out first day, 2nd on third day, tampon on 10th day. Discharged cured 39th day.	Bacillus coli communis.
3038	H. F.	20	S.	Machinist.	Five days before entrance sudden abdominal pain, general for two days, then localized in right iliac fossa, later general again. Vomited several times first two days. Bowels moved with cathartics up to 4th day.	Tem. 101°. Pulse 120. R. 20. In marked state of shock. Abdomen distended, rigid, board-like; everywhere tympanitic and tender to pressure. No localized dulness or special point of tenderness.	Immediate operation. Incision through right rectus. Free pus on opening peritoneum. Intestines injected and flaked with fibrin. Appendix gangrenous, perforated—removed. Lavage with saline. Gauze and two glass drainage tubes.	Did not rally from operation. Death in six hours. Discharged dead. (No autopsy.)	Bacillus mucosus capsulatus. Streptococcus pyogenes.

Surgical Number	Name	Age	Condition	Occupation	History Present Illness	Physical Examination on Admission	Operation	Convalescence and Result	Cultures
3536	T. B.	35	M.	Paper-hanger	Four days before entrance severe pain umbilical region, which became general, persistent and increasing in severity. Vomiting steadily for four days, at first food, later brown stinking material. No movement for four days. No chills. Slight fever. Great discomfort from distension. Tender on pressure.	Tem. 100° Pulse 105. R. 26. Marked degree of surgical collapse. Abdomen distended and tense, tympanitic; everywhere tender, especially about region of cecum.	Immediate operation, preceded by gastric lavage. Median incision, pus free in abdomen. Appendix gangrenous, perforated—removed. Intestines distended, injected, covered with clots fibrin. Lavage of intestines which were removed from abdominal cavity and replaced. Adhesion in one coil of intestine had produced kink and obstruction. Iodoform gauze. Two glass drainage tubes.	Did not recover from shock of obstruction which preceded the operation. Vomiting continued. Bowels moved only slightly. Strong stimulation, gastric lavage and enemata were inefficient. Enterostomy done 48 hours after operation. Discharged dead two days post op. (No autopsy.)	Bacillus coli communis.
3844½	P. M.	13	S.	School boy.	36 hours before entrance sudden pain in region of cecum, with tenderness. First attack. In 24 hours pain became general, followed by distension and persistent vomiting. Tem. 103.5°. Pulse 160. No chill. Bowels did not move since attack.	Tem. 99.6°. Pulse 140. R. 35. In marked state of collapse. Abdomen greatly distended, tense, tympanitic, tender to pressure everywhere. No special point of local tenderness. No localized dulness.	Immediate operation. Median incision, free pus found, incision closed. 2nd incision over cecum. Appendix gangrenous, perforated—removed. Intestines injected, covered with flakes fibrin. Pus thin, yellowish color, fecal odor, large amount free in pelvis. Lavage abdomen with sterile water. Two glass drainage tubes, with iodoform gauze.	Drainage tubes removed by patient 1st day after operation. Gauze packing replaced. Convalescence otherwise uneventful. Wound entirely closed on 37th day. Discharged cured.	Culture was sterile, though cover-slip showed many pus-cells and bacilli.

Surgical Number	Name	Age	Condition	Occupation	History Present Illness	Physical Examination on Admission	Operation	Convalescence and Result	Cultures
4199	L. K.	10	S.	School boy.	72 hours before entrance sharp pain in region of cecum, radiating to epigastrium. Vomited four times. Symptoms continued next day with tenderness at McBurney's point. Bowels moved with cathartics. 3d day distension appeared, increasing severity of pain, with general tenderness. Tem. 102.5°. 1st attack.	Tem. 102.5°. Pulse 138. R. 26. W. B. C. 23,000. Abdomen somewhat distended, everywhere tense and rigid, tympanitic, except area size of orange at McBurney's point, which is flat. Muscle spasm more marked on the right side.	Immediate operation. Diagonal incision over cecum. Free pus in abdomen. Appendix gangrenous—removed. Lavage of abdomen with saline. Drainage tube to pelvis and gauze. Intestines injected with fibrin clots.	Convalescence complicated by secondary abscess under liver. Drained by posterior incision. Discharged cured 40th day.	Staphylococcus pyogenes albus. Streptococcus pyogenes. Bacillus coli communis.
4366	E. L.	19	S	Machinist.	Admitted to medical ward at 4 p. m. Diagnosis made of general peritonitis, and case transferred to surgical. Mother refused to allow operation until her arrival next morning. Patient too sick to give any history.	Tem. 99°. Pulse 160. R. 28. W. B. C. 12,000. Patient delirious and apparently suffering great pain. Abdomen tense, rigid, distended, tender everywhere. No localized areas of induration or tenderness made out.	Operation 20 hours after entrance. Vertical incision along edge right rectus. Liquid feces and pus found free in abdomen. Appendix not sought for. Lavage of abdomen with sterile water. Three glass drainage tubes. Intestines inflamed and injected, distended.	Death 19 hours after operation, without rallying from state of collapse in which patient entered hospital. Discharged dead.	Bacillus coli communis. Staphylococcus pyogenes albus.
4441	M. V.	21	S.	Student.	30 hours before entrance nausea and vomiting, without pain. Six hours later sharp pain in epigastrium, later vomited again. Six hours later dull pain over whole abdomen. Pulse 80. Tem. 99°. Just before entrance bowels moved after cathartics. Pain increased in severity and was greater in region of cecum. 1st attack.	Tem. 100.8°. Pulse 136. R. 38. W. B. C. 34,000. Patient looked very ill. Anxious expression. Abdomen slightly distended. No marked rigidity. General tenderness to pressure. Most marked over cecum. No areas of dulness on percussion. No mass to be felt anywhere.	Immediate operation. Vertical incision along edge right rectus. 300 c. c. thin free pus escaped from abdomen. Appendix gangrenous, perforated—removed. Intestines injected. Lavage of abdomen with sterile water. Two glass drainage tubes to pelvis, third to stump.	Uneventful convalescence. All drainage out 12th day. Wound sutured 16th day. Closed solid on 35th day. Discharged cured.	Bacillus coli communis.

Summary:

Recoveries	5
Deaths	3
Total	8

DISCUSSION

Dr Charles Graefe, Sandusky: I would like to ask Dr Allen whether he makes multiple incisions in the gut in these grave cases, or only one incision. I take it he makes the incision in the first portion of the gut which presents itself. In my opinion if we could irrigate the intestines by passing tubes into these openings, and using salt solution in the intestine, we might remove the gas and fermenting substances and wash out the bowels, thus removing the most distressing and dangerous element in these cases.

Dr Julius H. Jacobson, Toledo: I think that such a valuable paper should not be allowed to pass without some discussion on this very interesting subject of general suppurative peritonitis. The late Gregg Smith stated that about 95% of all cases of suppurative peritonitis died. I think if one will read the surgical literature of later years he will discover that more cases are saved than formerly. It seems to me in discussing this subject we must first consider the anatomic and histologic conditions which prevail in the peritoneum. I believe that Fowler struck the keynote when he emphasized the fact that in a consideration of these peritoneal affections we must always study the anatomy and histology of the peritoneum. He points out that in the diaphragmatic peritoneum we have a greater number of lymph stomata which will take up fluid secretions very rapidly and are from thence carried into the system. In the order of frequency of absorption he mentions the diaphragmatic peritoneum as coming first, second the enteric diaphragm and last the pelvic peritoneum in which we have a rich network of capillary vessels.

We have then a rapid throwing out and absorption of septic material into the system and this very often defeats the very object which we wish to obtain. On the other hand, we see clinical cases of suppuration in the pelvis where it is limited and confined with no systemic absorption and consequently death does not result. Fowler's position or theory is somewhat similar to what the Doctor has given us today. If after these cases of acute perforating appendicitis with general suppurative peritonitis the abdomen be opened quickly and as much cleansing as possible be made, then an opening made in the median line above the pubes with a large drainage tube passed down through the lowest portion of the cavity, and the patient set up in bed, or have the

head of the bed inclined at an angle of 45°, we will have many more recoveries. I have seen this plan of treatment carried out in cases of gastric ulcer, acute perforating appendicitis, and in acute typhoid fever perforation, and I want to emphasize this as being a fine procedure. I think Fowler's position a better one than the Doctor advocates in that you can collect all of the septic material into the lowest portion of the abdominal cavity, whereas in the Doctor's position you will be likely to collect some pus along the flanks and side. Those of us who have experimented on the lower animals as to the rapidity of absorption of fluids by the peritoneum will understand in the abdominal cavity it will absorb 48% of the body weight of fluids within an hour, and if we can prevent this absorption by confining the fluid in the pelvic peritoneum we are accomplishing a great deal. The success of the cases can be summed up as follows: After all, tension plays a very important part in the absorption of toxic products. If by an incision over the pubes we can relieve the tension we accomplish some good. Pus in the peritoneal cavity without tension may not do any harm, but pus under tension produces great havoc. By peritoneal drainage we relieve this tension. The type of infection also is very important, whether it is limited or not.

As regards the time of operation, I would say the earlier the better. I believe very often in these cases, especially in peritonitis following gastric ulcer and typhoid fever, operation is neglected. If an earlier diagnosis were made, and this procedure were then carried out, there would be more lives saved. I believe the Doctor has struck the keynote in his postural drainage and tubes passed down into the pelvis.

Dr N. P. Dandridge, Cincinnati: I wish to thank Dr Allen for this paper which deals with a very practical subject. I am sure that cases of this character put us all to the test, the mortality always being high, and each one of us would certainly be glad indeed to utilize any measure by which this high mortality might be reduced. I do not think the question of drainage in the abdominal cavity is so easily solved, or can so easily be carried out as suggested by Dr Allen. We can put our drainage tubes into the cavity but the rest of the area is walled off in a short time. I think in what Dr Allen has offered us we have something that is encouraging and it is on the right track, in this thorough washing out of the cavity and as thorough drainage as we

can accomplish. I consider that we have a great deal yet to learn in regard to the various infections of the peritoneum. I believe the prognosis of these cases will be determined in the future by the character of these infections. I am sure that we have all opened cavities in which there was found evidence of peritonitis and which differed very materially; in some cases we have a plastic lymph, in some cases the peritoneal surface has been materially changed from having lost its lustrous appearance, and in other cases there is pus in the cavity, in which the peritoneum seemed to be very little affected. I believe our prognosis will be along the line of the bacteriologic observations on the character of the infection with which we have to deal. I want to express my appreciation of the paper and particularly with that part dealing with obstructive symptoms after operations, not only for appendicitis but also for various other forms of abdominal operations. This quick and ready method of opening the bowel and relieving the abdominal contents I believe to be a great life-saving procedure. These cases do not tolerate long operations. In many of these cases if it is thought necessary to remove a considerable portion of the bowel, the operation requires much time and with more or less shock to the patient, but if by a simple incision we can relieve these patients by simply drawing a loop of the bowel out and making an incision in it (thus relieving the contents of the bowel), we have certainly accomplished much for our patient. As I stated before, I think this to be a life-saving procedure, and while it has been advocated before I do not think that it has met with the general acceptance which it should.

Dr Martin Stamm, Fremont: I want to congratulate the Doctor upon the splendid results obtained in his cases. I wish to ask two questions. First, whether he thinks it advisable in every case in which the intestines are distended to relieve them of their contents, or only in those in which there seems to be a paralysis of the intestines. Second, whether he uses flushing only at the time of operation. I know some authorities recommend a repetition of the flushing. One operator makes incisions in different directions on both sides of the hypochondrium and in the inguinal region.

Dr W. H. Humiston, Cleveland: This subject is of very general interest to the operator, and I think Dr Allen

has put it before us in a very practical way. The essentials are early operation, thorough cleansing of the abdominal cavity without handling the intestines, thorough drainage, and placing the patient in Fowler's position. I have a case now at St. Vincent's Hospital, which I hope to show the members of this section tomorrow, in which recovery has taken place following a suppurative peritonitis, appendicitis ruptured, and a suppurating leaking dermoid. I believe that this case was saved by a rapid operation, thorough cleansing and drainage, and by another important procedure which I wish to emphasize here, *viz.*, the introduction of sterile saline solution under the breast during the operation. In an operation lasting from 15 to 20 minutes (and you do not want to be much longer in such conditions) you can get nearly two quarts of saline under the breast. By this method you can take the patient off the table with a pulse better and slower, and the general condition much more favorable than it had been for some hours before the operation. I wish to emphasize this one point in addition to those brought out by Dr Allen, *viz.*, the commencement of the saline solution as soon as the patient is partly under the anesthetic and continuing it during the operation.

Dr S. S. Halderman, Portsmouth: I wish to ask Dr Allen if he would advise the removal of the appendix in cases of general suppurative peritonitis, particularly in the class of cases which he has reported.

Dr Frank C. Larimore, Mt. Vernon: I have been very much interested in Dr Allen's paper and, as has been stated before, I think Dr Allen is to be congratulated. It brings vividly to my mind a case which I had under my care three or four years ago which treated me to several surprises. My patient was a young man of medium build. He had had an attack of appendicitis in February. Along in July or August he had a second attack. The physician who was called in to see him recognized the trouble, and on the third day of this second attack he was brought to my hospital about 9 o'clock in the morning. His condition was not alarming, and I did not therefore proceed to operate upon him at once, but decided to do so in the afternoon. At that time I made the ordinary incision in the abdominal wall and very much to my surprise pus poured out of the abdominal cavity; I could not restrain it. It was a very easy matter to remove the appendix in the ordinary way, there being no adhesions

whatever. The intestines were not distended, and the man was not in a condition of shock or anything bordering on it, in fact there was nothing that would lead me to suppose there was pus in the abdominal cavity. I pursued what was a very unorthodox procedure, washed him with a saline solution and closed up the wound. He made a beautiful recovery. This case certainly was a great surprise to me.

Dr Wm. E. Lower, Cleveland: I have been very much interested in Dr Allen's paper. In considering these cases the question naturally arises whether nature had not overcome the infection at the time of the operation; *i. e.,* whether the real virulency had not been overcome. I believe in the last few years the concensus of opinion is against an early operation in general suppurative peritonitis. Ochsner says that since he has adopted the plan of waiting in these cases that his mortality has been much reduced. In an attack of general suppurative peritonitis it is a question of overcoming the septic infection. During the period of active absorption of septic material, when the system is taxed to the very limit in an effort to overcome the infection, it is a question whether the shock produced by the giving of an anesthetic and an operation would not prove fatal, when if left alone the infection might be limited, and a more favorable time afforded for a safe operation. The method, as outlined by Ochsner, combined with an opiate, as recommended by Alonzo Clark, arresting peristalsis and waiting for localization, is my plan of treating these cases. Of course where you have cases in which the pus is under great tension, then a quick operation to relieve this tension is the thing to do, but at the time in which the pus is not under very great tension and the infection is active it is very questionable whether these patients should be operated upon until later.

As to opening the bowel for distension, I think it depends entirely upon whether the distension is due to mechanical obstruction or from obstruction due to paralysis. If it is due to paralysis, opening of the gut simply causes a local collapse of the bowel. However, if due to mechanical obstruction, opening of the bowel is of the greatest benefit.

Dr Dudley P. Allen, Cleveland, closing discussion: In reply to the question as to the number of incisions made in the gut, I would say that one is usually sufficient, but occasionally a subsequent incision is necessary. The first time I tried this

procedure, I had no instruments with me, save a pair of scissors and two safety pins. With the safety pins I pinned the bowel up to the abdominal wall, and then opened it with the scissors. I have been in just such a predicament several times since. I have employed the method described in the paper for many years and I am persuaded that it is a very valuable procedure, but as to whether one or two openings should be made depends upon whether the original opening relieves the distention of the gut.

With reference to the stomata of the peritoneum covering the diaphragm, I have been very much interested in the question of their frequency in different portions of the abdominal cavity, and I should be very glad to show Dr Jacobson some specimens which I have taken from animals which will illustrate the point in question. Recent publications lead me to think that we are in error with reference to the number of stomata in various portions of the abdominal cavity. I think we shall probably have to revise our ideas with reference to them.

With reference to the question of drainage, whether it be more difficult in the upper than in the lower portion of the abdomen, I have tried it not only in cases of suppurative appendicitis, but also in rupture of the gall-bladder, etc., and my experience is that it makes very little difference as to whether the trouble is in the upper or lower portion of the abdomen when we come to drain. As to whether drainage is better sitting up in bed or lying on the side, I have tried the method of sitting patients up in bed repeatedly, but my experience is that I get better drainage by having them lie on the side. If they are in a condition of shock they do much better than when sitting up, there is not so much strain upon them, and the holding of them up by straps passed under the shoulders according to the method commonly used in these cases is very tiresome to them.

As to the type of infection making a difference in the outcome of the cases, without going too much into detail on this matter, I will say that I made a table of the various bacteria found in my cases. In a few instances nothing grew from the cultures. Whether this was due to the lack of proper care I do not know. In one case we found the staphylococcus pyogenes albus, in another the bacillus coli communis, in one a streptococcus was found, etc., etc., but the bacillus coli communis was most frequently found. The

patient died in whom the streptococcus was found. This death could hardly be charged to the presence of the streptococcus infection because the patient's mother absolutely refused operation until the patient had been in the hospital 24 hours, and had gone far beyond the point where there was a reasonable chance for the success of the operation.

In reply to the question of Dr Stamm as to whether the intestines should be opened at the time of the original operation in all cases of distention, I would say that I hardly know how to answer him. I have always thought that it would be a good idea to empty the intestines when greatly distended. In some cases I have tried this and the patients have died, and in other cases they have gotten well. I do not open the bowel unless it is distended.

As to flushing at the time of operation or afterward, I cannot convince myself that much is gained by subsequent flushings. I am inclined to think that one efficient flushing at the time of operation is all that is of benefit.

Dr Humiston has spoken of the use of saline solution during the progress of operation. The use of saline solution is valuable, but I have not made a practice of using the saline at the time of operation. I have used it after the operation, the condition of the patient at the time determining what we shall do. If the patient is in a fair condition I give the saline by the subcutaneous method, if there is great shock present, by the intravenous method, and I find it very valuable in such cases.

Dr Halderman has asked about the removal of the appendix. It is always removed if possible. In the presence of general suppuration one can ordinarily lift the whole cecum out of the abdomen and quickly remove the appendix. Since general infection already exists one need not fear the contamination of unaffected parts.

With reference to Dr Stamm's case, I have wondered if he was correct in saying that it was a case of general suppurative peritonitis. It is very difficult many times to tell whether a case is one of general or limited peritonitis. Eminent surgeons have remarked to me that no case of general peritonitis ever gets well. I do not believe that cases of peritonitis recover without operation unless the pus is limited to a portion of the abdominal cavity. The fact that Dr Stamm's case recovered is most interesting. It may be that the bacilli or cocci producing the pus died and the

pus became sterile. I think that possibly this is the only explanation that we can give to these cases.

In reply to the remarks of Dr Lower, I distinctly stated that the method was not applicable to such cases as mentioned by him. If his suggestion were followed in cases such as those cited the result would be absolutely fatal. I do not believe such patients would survive long enough to permit us to use the method. I stated that these were a class of cases outside and beyond that method and I believe every one would have died by a less radical and prompt method than that adopted.

With reference to paralysis and mechanical obstruction of the bowel, I think it is very difficult to tell the difference. I do not believe that any considerable portion of the cases of paralysis occur until very late. If we operate early we will not have to make a diagnosis between these two conditions.

Contracture of the Neck of the Bladder

By Thomas Grant Youmans, M. D., Columbus

By way of introduction to my subject, I shall outline to you three interesting cases:

Case I: R. L., 47 years old, contracted gonorrhea at the age of 18, which lasted three years. Six years later he had several attacks of retention. The passage of sounds for the relief of this trouble infected his bladder, causing cystitis. Three years after this, an internal urethrotomy was performed under chloroform. The operation was followed by profuse hemorrhage, and three days later, by urethral fever, the patient being unconscious for several days.

In January, 1900, the patient consulted me at the dispensary, suffering with chills and fever due to the local infection. With great difficulty he succeeded in passing a small glass of urine, which was loaded with pus and mucus. Examination of the urethra revealed the presence of stricture in the anterior portion, two inches from the meatus, measuring No. 15 French, and a dense fibrous mass in the bulbous portion, which would admit only a No. 3 French. Examination of the prostate per rectum revealed no enlargement. The patient was advised to enter the hospital for operation.

I saw nothing of him, however, until March 17, when he applied to the hospital for admission, having suffered with retention of urine for three days. The patient was tapped and 40 ounces of urine was obtained. Hot sitz baths, with one-fourth grain doses of morphin, were given, but with no abatement of the retention.

Operation: External urethrotomy without a guide. A No. 15 French sound was inserted as far as the face of the stricture. An incision was made directly over the point of the sound, and carried carefully down in search of the urethra. The sound being engaged in a false passage, its point was diverted about three-eighths of an inch to the left of the median line. My incision was thus led astray, and, after a most careful search, I was unable to locate the lower portion of the urethra. A suprapubic opening was now made, and retrograde catheterization was performed. Great difficulty was experienced in trying to engage the sound in the urethra, as the internal meatus was almost completely closed. After I succeeded in introducing the sound, the point was brought out through the perineal incision. Withdrawing the instrument, I followed the point back with my left fore-finger. At the internal meatus I detected a distinct circular band resembling stricture. To my finger it felt like a hard, fibrous band, covered with mucous membrane. It imparted the same sensation as a piece of wire covered with rubber, like that used for babies at teething-time. I dilated it with my finger until the resistance of the parts had been overcome. No. 20 French catheter was inserted in the perineal incision for drainage.

The following morning we were unable to obtain urine through the catheter after repeated attempts. Thinking that a clot might have lodged near the eye of the instrument, I decided to withdraw the catheter about one inch and reintroduce it. The catheter seemed to be engaged more firmly than usual, and after withdrawing it, I was unable to reinsert it, owing to the presence of some obstruction. Suspecting that the band I had encountered in the operation on the

previous day might be the cause of the trouble, I opened the perineal incision under ether. Carrying my finger back through the prostatic urethra, I again felt the same band of fibrous tissue. This band, or collar, had closed down, making it impossible to reintroduce the catheter. Using the finger for a guide, I passed the scalpel back, cutting through the band on the floor. Very little hemorrhage followed. A No. 20 French catheter was put in place, and the sides were packed with iodoform gauze. The closing of the perineal incision was retarded by the weakened condition of the patient, and by the presence of a great amount of fibrous tissue.

At the end of four weeks, although the patient was urinating through the perineal opening, I advised him to leave the hospital and seek fresh air and good food for a period of six months. He returned in the fall, having gained 50 pounds. The fistulous opening in the perineum was now dissected out, and the urethra joined. At the same time, I introduced my finger into his bladder to examine condition of posterior urethra. The constricting band at internal meatus had entirely disappeared. Five weeks later the patient was discharged. He has since married and become a father.

Case II: F. C., of Middleport, Ohio, age 35, had gonorrhea in 1895. A stricture developed at the bulbomembranous junction. Three years later he had his first attack of retention. Sounds were introduced, carrying infection back into the bladder. As a consequence, the patient developed cystitis, with frequent attacks of retention.

He reached the hospital at midnight in August, 1900, having had retention for two days. Although his bladder did not contain more than five ounces of urine, he was suffering the most excruciating pain. Being unable to introduce a filiform, I was forced to make an external urethrotomy without a guide. Digital examination per rectum revealed no prostatic enlargement. The incision was made in the median line of the perineum. Careful dissection brought to view

the posterior urethra. Thick, greenish-yellow pus began flowing out of the incision. It amounted to 10 ounces in all, and showed evidence of stone in the bladder. After the stricture was divided, the left index finger was passed back to the vesical neck. At this point, as in the case previously described, I encountered an extremely rigid collar surrounding the urethral orifice of the bladder. This constricting band would barely admit the tip of the index finger. Forcing my finger through, I was able to detect the presence of several stones in the bladder; but the ring would not permit the introduction of the bladder scoop. The ring was, therefore, incised. At this juncture the state of the patient was such that we were forced to abandon our work, postponing the removal of the stones. The bladder was irrigated four times a day for six weeks. At the end of that period a suprapubic opening was made, and four stones were removed. Exploration of the prostatic urethra found the neck of the bladder in good condition, while the constricting band had almost entirely disappeared. The patient is now enjoying good health.

Case III: T. R., of Altoona, aged 68 years, consulted me in December, 1900. The patient has had two attacks of gonorrhea. For the past nine years he has had marked frequency and urgency of urination. For the past year he has urinated once an hour during the day, gradually increasing in the night, until, in the early morning hours, he empties his bladder every 30 minutes. He experiences great difficulty in starting the stream and has much pain at the close. He has had several attacks of retention, with more or less dribbling. The residual urine is three ounces. The urinary distance is eight and one-quarter inches. No appreciable enlargement of the prostate can be felt per rectum. The urine shows presence of pus, and small quantity of albumin. A small amount of hyaline casts and cells from the pelvis of the kidney are present. A cystoscope is introduced with great difficulty as it meets an obstruction at vesical neck. Examination of the bladder shows the walls to be trabeculated and the seat of a chronic inflammation.

Operation: Perineal cystotomy. There is a dense fibrotic

ring at the neck of the bladder, which is incised with the knife. There is no reaction from the operation, and little hemorrhage follows. The perineal tube is removed in 10 days. The residual urine at the end of two weeks is but one ounce, and this is gradually reduced until, by January 30, there is no residuum. The urine is cloudy, but not offensive; dribbling has entirely ceased. March 1, he urinates three to five times by day, and can go the night through with emptying the bladder but once.

In addition to this class of cases, I have met cases of milder degree while operating for stricture, complicated with cystitis. These less rigid ones have been reduced by simply dilating and rupturing the band with the finger until all resistance has been overcome. More recently I have used the galvanocautery of Wishard, which has been lately introduced.

Contracture of the vesical neck refers to a ring-like band of muscular and fibrous tissue surrounding the prostatic urethra at or near the internal meatus. This condition follows reflexly upon local disturbances in the urethra, the bladder, the seminal vesicles, or the kidneys. Normally, at this point, the canal is wide, funnel-shaped, and elastic. It passes into the cavity of the bladder in such wise that its juncture with that organ is difficult to define. Contracture of the neck of the bladder is a subject that has been discussed from several different standpoints, although the literature is not extensive. There are various degrees of contracture, depending upon the length of time it has existed, and the intensity of the inflammation that gives rise to it.

Its general symptoms sufficiently indicate that its nature is primarily that of a neurosis. The contracture may be temporary and mild, being purely functional and reflex in character; or, it may become chronic, resulting in a round-cell infiltration of the tissues encircling the neck of the bladder, and giving rise to a fibroid stenosis of the vesical neck. Finally, the bladder loses its tone, becoming pouched behind the stenosis, containing residual urine, and simulating pros-

tatic obstruction. Although the closure is never complete, it is frequently so small and so rigid that the finger cannot be forced into it. There are no symptoms positively characteristic of this condition, except the signs brought out by a physical examination. The symptoms of contracture of the neck of the bladder are usually so masked or complicated by the symptoms of the diseases that give rise to it that oftentimes a positive diagnosis cannot be made without an actual examination of the parts. Yet there is a certain group of symptoms which, coming on gradually and in the absence of prostatic enlargement and vesical or renal tuberculosis, is very suggestive. Chief among these are: pain; frequency and urgency of urination, more especially by night; difficult urination; dribbling from irritation or overflow. In chronic cases the force of the stream is diminished, and in many instances complete retention occurs. Examination per rectum reveals nothing peculiar to the condition. Since the caliber of the contraction corresponds closely to that of the urethra, its presence cannot be detected by the passage of a good-sized sound. A cystoscopic view of the bladder should be taken whenever possible. The symptoms of contracture oftentimes resembles those of stone in the bladder, although these conditions may coexist. Examination of the interior of the bladder, when this is possible, will enable the surgeon to detect the presence or absence of stone. I am not prepared to say whether the contracture in these cases is produced by the presence of the stone or whether the stone is secondary to the contraction. In the case I reported, I believe the contraction was secondary to the long-standing posterior urethritis, which is the most frequent cause, and that the stones resulted from the obstruction offered to the stream by the contracture.

On account of the obstruction to the urinary outlet, many cases of contracture of the neck of the bladder are diagnosed and treated as senile prostatic hypertrophy. This is especially true in cases of prostatic atrophy in which we have many of the symptoms of hypertrophy; in cases of so-called prostatic

hypertrophy which occur at an unusually early age; and in cases of so-called prostatic hypertrophy in which the symptoms are not justified by the existing enlargement of the prostate. Keyes observes that "when there are symptoms of prostatic retention without any hypertrophy of the prostate, or increase in urinary distance, the essential lesion is a contracture of the neck of the bladder." Sir Henry Thompson emphasizes this fact when he says: "An organic obstruction may exist at the neck of the bladder when there is no enlargement of the median portion of the prostate. In this case it is most commmonly due to hypertrophy of the muscular fibres at the neck of the bladder produced by long continued irritability of the viscus and generally occasioned by stricture of the urethra, inflammation or calculus of the bladder, and occasionally appearing without any of these conditions."

Contracture of the neck of the bladder may coexist with hypertrophy of the prostate, forming a part or all of the obstruction that produces the characteristic symptoms of prostatic hypertrophy. The possibilities of a mistaken diagnosis here will be readily perceived. The pronounced symptoms of prostatic hypertrophy in such cases are calculated to throw the surgeon off his guard, so that the contracture at the vesical neck may be entirely unsuspected. Thus, Eastman, in the *Medical News* for September 5, 1903, reports the case of a man of 69 suffering from chronic enlargement of the prostate, with its attendant symptoms. He did a perineal prostatectomy, using the inverted Y-incision of Senn, without opening the urethra or bladder. The removal of the prostate, which was five times its normal size, afforded no relief of the distressing symptoms. Accordingly, three weeks later, a perineal cystotomy was performed. A collar-like obstruction was discovered at the internal meatus, which raised it a half inch above the floor of the bladder. The ring was divided with the galvanocautery of Wishard. This operation relieved the symptoms, and was followed by a good recovery.

The treatment of this affection consists, first, in the

removal of the primary exciting cause. In the milder grades, rupturing the fibers with the finger, introduced through the perineal incision, usually suffices. In chronic cases, it is impossible to do this, and it, therefore, becomes necessary to divide the contracture with a knife, or with the galvanocautery, introduced through a perineal incision. It is important to make the division in the median line and on the posterior border of the vesical orifice. In cases in which the Bottini instrument can be introduced, it may be employed, although I believe perineal cauterization is much better and safer. By this method the surgeon can carefully palpate and inspect the parts, making the incision with greater accuracy, overcoming all danger from hemorrhage and affording perfect drainage. This last provision is very important, since the great majority of these cases are septic. Care should be exercised not to carry the incision too far, for if all the muscle fibers encircling the neck are divided, incontinence may supervene. Section of all the fibers, with resulting incontinence, is especially liable to follow the use of the Bottini instrument, since in the use of this instrument we are unable to determine the extent of the contracture, the manipulations being carried on wholly in the dark. With the Chetwood incisor, introduced through a perineal incision, we are able to palpate the parts, and to form a very intelligent idea of the existing condition. *But* the Wishard incisor, with the combined cystoscope and air dilatation, goes a step further, allowing us not only to palpate the parts, but to inspect the vesical neck and the interior of the bladder, and giving the best view obtainable. For these reasons the Wishard incisor is preferable to all other methods.

The after-treatment is important, and resolves itself into that of a perineal section. Drainage by means of a soft rubber catheter, introduced through the perineal incision, should be established for a period of three to ten days, when the incision should be allowed to close, the patient urinating through the natural channel. Urotropin should be given in seven and one-half grain doses in a glass of water four times

a day. Daily irrigations of the bladder with argyrol should be practiced until all signs of cystitis have disappeared. In cases complicated with stricture, sounds are not indicated until perineal incision has had ample time to heal. Too early and too frequent use of sounds often proves detrimental.

Meckel's Diverticulum

With Report of Strangulated Inguinal Hernia of Same

By Frank E. Bunts, M. D., Cleveland

Meckel's diverticulum, or the diverticulum ilei, is sufficiently common to merit a greater familiarity with it than commonly exists, and its importance arises chiefly from its relation to certain forms of intestinal strangulation, to the persistence from birth of a fecal fistula at the umbilicus, and, more rarely still, to its presence in a hernia. It is my desire to place on record a case of strangulated inguinal hernia in which the sole contents was a Meckel's diverticulum. It may be of interest in this connection to give a general outline of this diverticulum, its origin, development, and subsequent changes.

Lavater is said to have been first to record its having been observed, and Ruysh in his *Thesaureus Anitomicus,* published in 1701, also called attention to this abnormal development, giving it the name of diverticulum and presenting an illustration of the same. Morgagni, in his treatise on the Seats and Causes of Disease, reports several cases of diverticulum of the ileum and also mentions that he had a case of inguinal hernia in which it was found, and states also that he had seen the same diverticulum in geese, particularly one of such breadth that it could not be taken for the remains of that duct which has formerly belonged to the vitellum, thus recognizing its embroyologic import and derivation.

We must, however, render to Johan Friederich Meckel the distinction of first calling a more general attention to the diverticulum ilei which in his essay he most clearly

differentiated from the acquired pseudodiverticuli occasionally found along the course of the intestinal canal. It was Meckel who advanced the theory that it represented the remains of the omphalomesenteric duct, which theory has received common recognition. He also called attention to its importance in the causation of certain intraabdominal affections.

It is interesting to note that the American ornithologist, Elliot Coues, to whom the research of Meckel seems not to have been known, reports two cases of these rare malformations under the name of umbilical cæca. His deductions are most interesting as he not only arrives at the same conclusions drawn by Meckel 50 years previous, but from his knowledge of ornithology, the more fully substantiates this theory. Coues states that in the Class Aves a true umbilical cecum is frequently to be met with, forming a diverticulum or pouch to which those described by him are, at least, in their material features quite similar. This diverticulum he states is situated at the original point of entrance of the vitelline duct into the intestine and is the remains of or rather an indication of the previous existence of the duct. He further adduces the confirmatory fact that a remnant of an embryonic organ is quite persistent and very generally to be found throughout the lower orders of birds as the Grallatores and Natatores, while in the higher orders as in the Raptores and Passeres it is only of exceptional occurrence and difficult of recognition.

Ahlfield, among others, denies that the diverticulum derives its origin from the vitellointestinal duct, and claims that it is developed as the result of traction upon the intestine by the ductus omphalomesentericus. This duct normally remains in connection with the intestine until the latter recedes into the abdominal cavity or at about the third month. At this time discontinuity between the duct and intestine should occur. Should this disconnection not occur manifold congenital variations of the gut may result. Among these variations is mentioned Meckel's diverticulum, it being

the direct result of traction exerted upon the intestinal wall which, gradually giving way at the point of greatest traction, gives rise to the formation of such an appendage.

The relative frequency of the occurrence of this diverticulum was noted by Rolleston, of St. George's Hospital, to be 10 in 337 cases examined, a percentage of 3.37%. Osler observed it in 2% of cases. In the Collective Investigation of the Anatomical Society of Great Britain and Ireland, it was found 16 times among 769 subjects, a trifle over 2%. This is in accordance with the statements of Quain and Treves. Mitchell found it present in 39 cases out of 1635 examined, or slightly over 2%, but remarks that its order of occurrence is quite inconstant, thus in 200 successive autopsies not one case was found and then again its presence was noted in two successive cases. Kelynack found but 18 examples among 1446 subjects examined, a proportion of a little over 1%, while Albers says that it occurs about one time in 1000 subjects examined, making it 1/10%. This certainly seems too low an average. Out of Mitchell's 39 cases, it was found four times in women and 35 in men. Kelynack in 18 cases reports 11 as occurring in males to seven in females, there being thus a decided preponderance in frequency in the male. While the frequency of its occurrence has varied considerably according to the various observers, yet it will be found that its location is subject to still greater variance. Meckel's diverticulum is usually stated to be in the lower fourth of the ileum at a variable distance of from one to four feet from the ileocolic valve, this being the position assigned to it by Meckel himself. Gegenbauer gives it at from ½ to 2 m.; Henle as 1½ to 3 feet; Quain as an average of 48 inches with a variation of from 11 to 120 inches; Tillman states it to be 1/3 to 1 1/3 m. from this point; Hemmeter says 1 to 6 feet, averaging 2½ to 3 feet; Treves from 15/36 inches; Kelynack gives an average of 39½ inches in 18 cases examined with the extremes of 15 to 50½ inches; Lamb in a tabulation of 185 cases, reports its being situated in 21% between the ileo-

colic valve, and one foot above this valve, in 19% two feet above this point and in 12%, 2 to 3 feet distant.

It does not seem, however, that the diverticulum is restricted to any particular portion of the intestinal tract, for it has been described as located anywhere from the pylorus to the ileocolic valve and to have been found in the cecal region as well as upon the esophagus. The term diverticulum ilei is therefore misapplied, as it occurs in the jejunum in a considerable number of cases. Lamb found the record of 14 cases in which it had occurred in the jejunum and of seven in which it had been found in the duodenum. Buzzi reports a case in which a diverticulum 33 mm. in length was found on the jejunum opposite its mesenteric border and 1 m. distant from the duodenojejunal angle. From its anatomic character and the microscopic research, he concluded that it was to be regarded as a misplaced Meckel's diverticulum. Treves, however, cites this case as being a congenital diverticulum of the jejunum quite distinct in origin from a Meckel's diverticulum. Similar cases are also reported by Clarkson and Collard, in one of which it was said to have had its origin 2 feet from the pylorus. Dr Elliot Coues reports two instances of this abnormal point of origin. Meckel refers to four cases reported by Walther and one by Grieding in all of which the jejunum was the site of this vestigial structure and considered them to be identical with those having their connection with the ileum.

Lamb states that it has been found 7 times in connection with the duodenum, and refers to 2 cases in the Army Medical Museum. In one of these, a female mulatto, 71 years old, it was found to arise from the middle of the duodenum, being about two inches long and having its outer wall so thinned that the presence of the muscular wall seemed to be problematic. Albers also reports a case of this kind in which the diverticulum arose from the transverse portion of the duodenum. Mayers reported a case arising from the duodenum and containing a number of *valvulae conniventes* for a short distance from the point of

origin. Nor, as has been before suggested, has the remaining portion of the alimentary tract been exempt from its occurrence. Fitz, in a paper on "Persistent Omphalomesenteric Remains" refers to the well-authenticated case of duplication of the esophagus, small intestine, cecum, and colon, and explains such anomalies on the assumption of an abnormally high or low seat of the omphalomesenteric duct. A duplication of this kind being of diverticular origin has originally a blind extremity, through the accumulation of meconium or pressure, perforation may result and thus explain the communication with the intestine proper which usually exists at both ends. Fitz concludes his statement by saying that the view that most if not all well-authenticated instances of duplication of its course, are the probable result of persistence and growth of the remains of the vitelline duct, is rendered highly probable from what is known concerning the development of the intestine.

The abdominal cavities are not differentiated at that period in fetal life when the vitelline duct is present. The seat of the latter high up or low down in the fetus would satisfactorily account for the various places in the origin of the duplication in question, as it does for those of the diverticulum. It has already been made apparent that the latter may arise at any point between the pylorus and the cecum. Whether the duplication or the diverticulum is to result depends presumably on the existence of conditions favoring or checking the growth of the intestinal walls. The duplication is thus to be regarded merely as an elongated diverticulum, and, like the latter, as will be shown later, may lie within as well as outside the mesentery.

This variability of position can alone be explained along developmental lines. In its earlier state the intestinal tube or gut tract is differentiated into three portions; a head gut which lies cephalad to the intestinal attachment of the vitelline duct; a hind gut which lies near the tail end of the embryo, and the midgut or intervening third portion. Later, *i. e.,* during the fifth and sixth weeks, when the pharynx,

esophagus, stomach and part of the duodenum have become differentiated in the foregut, the midgut becomes U-shaped and is then known as the umbilical flexure or navel loop. From this portion of the intestine are now developed the lower part of the duodenum, cecum, and colon. At the point of greatest convexity of this flexure the vitellointestinal duct is attached and toward it, also, proceed the omaphalomesenteric arteries. From the upper limb of the umbilical flexure is subsequently developed the jejunum and part of the ileum, from the lower limb the remainder of the ileum, cecum, and ascending colon. Since the point of attachment of the vitelline duct, as Heisler says, is not far from the termination of the small intestine, Meckel's diverticulum, when present, is connected with the lower part of the ileum at a point from one to three feet from its termination. In the subsequent development of the small intestine, however, different portions may be hindered in its growth as Leichtenberg states, the greater part of the small intestine is formed from the posterior or lower leg. The diverticulum in such a case would then be placed abnormally, *i. e.*, in the jejunum or even duodenum. A retardation of growth in the lower limb would on the other hand explain those cases in which Meckel's diverticulum is found a short distance from the ileocolic valve. This is the view which has also been advanced by Fitz, who, relative to the variation in the position of Meckel's diverticulum, says: "Since the diverticulum is present, if at all, in the earliest weeks of fetal life, it is obvious that its position with reference to the ileocecal valve must change with the growth of the intestine. The preponderant elongation of the intestinal tube above the insertion of the duct is accompanied by a less longitudinal growth below this point, and the diverticulum is usually found in the vicinity of the valve." The occurrence of the diverticulum prolongation on the ileum, jejum, and lower duodenum is most naturally explained by this theory. In the upper portion of the duodenum, in its first and second parts, diverticuli may, however, be of different origin. It

is known that the hepatic diverticulum from which the liver is developed, may give rise through developmental defects and aberrations to certain of these congenital duodenal diverticuli. Such diverticuli also occur as isolated pouches, which when present are constant in position, *i. e.,* above the biliary papilla, according to Treves. Other objections to the assumption that the duodenal diverticuli are in their origin vitellointestinal are also apparent in the individual cases reported. In the case of Lamb, the absence of muscular fibers rather denotes an acquired character and it can, therefore, not be considered a congenital structure. It belongs to the cases of false or pseudodiverticuli to which attention had already been called by Rokitansky.

As to the remaining parts of the alimentary canal (esophagus and cecum) in which the occurrence of duplication has been referred to, the abnormal position of the diverticulum and its subsequent growth, as already alluded to in the view of Fitz, and is dependent on the primary connection of the vitellointestinal duct and intestine, and do not result from a disproportion in growth of the digestive tract. The exact position of the diverticulum on the intestinal loop is in the great majority of cases along the free border of the gut or opposite to its mesenteric attachment. Yet this, too, is subject to variation. Kelynack observed that its origin was not always immediately opposite the mesenteric attachment. Kern in a case of patulous umbilicus, which he operated on, found that the diverticulum Meckelli arose from a position which was not directly opposite the mesenteric attachment of the intestine, but which lay toward the lateral aspect of the gut; and Dennis, in his System of Surgery, figures several specimens in which the diverticulum springs from the mesenteric border, and lies intramesenteric. In two cases reported by Mitchell (cases 5 and 13) it arose from the side of the gut, in one of these close to the mesentery. Fitz, in speaking of this lateral variation, remarks that the instances are not few in which the side of the intestine, even the immediate vicinity of the mesenteric attachment, is the starting point. He then

refers to a case in the Warren Museum, Specimen 732, an intramesenteric duplication of the intestine which was found in a child from 8 to 10 months old. Two intestinal tubes, more or less parallel, are to be seen in this specimen, one being in the usual position of the intestine, the other to its inner side, between the two layers of the mesentery.

The diameter of the inner tube is somewhat smaller than that of the outer except in the immediate vicinity of the opening at which the two tubes communicate where a dilatation exists. The contiguous portions of these two structures are in close proximity to each other throughout the greater part of their course and are fused near the common opening. This opening is rounded, sharply defined, 1/3 of an inch in diameter and appears to be covered with mucous membrane. The walls of these tubes are composed of mucous, muscular, and peritoneal coats, the mucosa of the outer tube showing slightly projecting transverse folds in the vicinity of the opening, while that of the inner tube is relatively smooth. Villi and crypts are said to be present in both these structures. Fitz concludes that in these cases the most satisfactory explanation of the origin of this anomaly is based upon its representing an intramesenteric diverticulum although its bifurcated shape and seat of constriction and dilatation deserve special consideration. As both these characteristics may, however, be possessed by other diverticuli, this objection is not valid. Dennis reports a similar case of intestinal duplication, where the accessory gut lay intramesenteric and for the explanation of which the omphalomesenteric theory is advanced. The cases of intramesenteric cysts of Roth are also to be classed under this category of lateral variation of Meckel's diverticulum, as stated by that writer himself. Treves, however, remarks of these cases that it is a question whether the elongated diverticuli which are described as growing between the layers of the mesentery are real instances of Meckel's diverticulum, but gives no evidence as proof for this assertion.

The length of Meckel's diverticulum is in part dependent

on the degree of involution the omphalomesenteric duct undergoes. Normally the involution of this embryologic structure is complete and no trace of its former existence is to be found in man. When present, however, its length forms one of its most inconstant characteristics. It is found as a small blunt peg-like projection and varying up to a diverticulum 10 inches in length. Its average length as given by Quain is 1—3 inches; by Rokitansky, 5—6 inches; by Henle, ½—6 inches; by Albers, 1—7 inches; by Kelynack, ½—6 inches, or an average of 2¼ inches. Cazin gives it as 1—7 inches or 8 inches, and Treves as 2—3 inches. Lamb in a tabulation of 185 cases found its length definitely given in 109 cases. In 44 cases it was reported as being from 1—2 inches long, in 29 from 2—3 inches; in 15 from 3—4 inches; in five, from 4—5 inches; in two, 6 inches, and in one, 7 inches. Lamb concludes that of the entire 109 cases the number of those in which the diverticulum was between 1—2 inches long exactly equalled those in which it was between 2—4 inches, giving an average therefore of two inches in length.

The usual form encountered is the tubular variety resembling the finger of a glove. In such a cylindric prolongation, the diameter nearly equals that of the gut proper. In many cases the diverticulum when of this form tapers more or less gradually toward its blind extremity. According to Treves the diameter of its base is usually less than that of the gut from which it arises, although sometimes the diameter of the two tubes may be nearly identical. It may also retain the same width throughout and thus resemble a glove finger, but its base is usually considerably wider than its free extremity. Tillman states that the diverticulum has sometimes a greater diameter than the small intestine itself. When attached to and patulent at the navel, the diameter throughout its course may remain unaltered or be but slightly diminished at its umbilical attachment. Among the divergencies from this usual form are to be mentioned the presence of constrictions which may occur throughout its

course, most usually, however, toward one of its two extremities. At the junction of the small intestine such a constriction, when marked, gives rise to the globular or inversely conical variety in which the diverticulum was connected with the ileum by a narrow mouth ¾ of an inch wide, then extended to a diameter of one inch and rapidly widened into a large pouch almost as big as the cecum. This dilated portion had a diameter of 3¼ inches, a circumference of 10½ inches, and lay quite free in the abdomen. Kelynack suggests that its large size is probably of an acquired nature and that it may be referred to as a distension from the intestinal contents. When the constriction becomes complete in the globular variety the communication with the small intestine may entirely or almost altogether cease and the diverticulum, as Roth has shown in the report of several cases, give rise to an intraabdominal cyst.

The extremity of the diverticulum varies considerably in shape. Thus it may be clubbed-shaped or in rare cases it may be bifed. Both Kelynack and Fitz refer to such cases. Treves speaks of a specimen in the London Hospital Museum in which the ampulla at the end of the diverticulum had a hammer-shaped outline. Hyrtl remarks that branch-like diverticuli are very rare, but reports an instance in which a diverticulum one inch in length and divided into five parts was found in a hemicephalic monster. More important than any of these cases are those in which the extremity is patulous and communicates with the exterior at the umbilicus. A patulous Meckel's diverticulum at the umbilicus gives rise to a fistula or what has been termed *anus preternaturalis umbilicalis*. This patulency is generally ascribed to the free end of the diverticulum extending through the umbilical ring into the umbilical cord, so that when the cord is severed the extremity of the intestinal appendages is likewise exsected. With the subsequent exfoliation of the navel, the umbilical fistula is established. This view is advanced by Merian Von Seibold and Shepard. Bart, on the other hand, claims that this does not occur and the

existence of a congenital umbilical hernia is not essential for the patulency of the umbilicus to result. According to this writer, the extremity of the diverticulum merely extends to the umbilical ring and does not pass beyond the same. A necrosis which may follow the separation of the cord can, however, establish an intestinal umbilical fistula.

In its structure Meckel's diverticulum resembles the small intestine, being composed of three coats. In the muscular coat both the longitudinal and circular fibers are directly continuous with those of the small intestine. The mucosa is like that of the intestine containing Lieberkuhns crypts, solitary follicles, and Peyer's patches. Of the latter but one is commonly found, and when present is subject to the same pathologic changes as take place in the ileum. Vaughn reports a case in which at the autopsy of a patient who died of enteric fever a diverticulum was found 7½ inches in length and containing two swollen Peyer's patches near its origin, and several enlarged ulcerating solitary glands. At the junction of the diverticulum and ileum the mucosa in reduplicating may give rise to a valve. Meckel observed its presence in three cases out of over 20 examined. He interpreted its presence to be an attempt at closure. According to Buzzi, Klebs also mentioned its occurrence as did Cazin and Albers who referred to a valve-like formation similar to those found at the ileocecal and appendiculocecal junctions. Roth reports a case in which this valve almost completely closed the intestinal opening and thus accounted for the small amount of intestinal contents which escaped through its fistulous opening at the umbilicus, the tube being large and patulous in its other parts. Structurally this valve consists of a reduplication of the mucous membrane between the two layers of which a certain amount of connective tissue is found; toward its attached end a few muscular fibers are also present. Roth says that a similar, though much less distinct valve, may occur at the umbilical end of a patulous diverticulum ordinarily from the obliteration of the emphalomesenteric vessels, but may be according to Treves referred

in some cases to the obliteration of a part of the diverticular extremity.

The occurrence of Meckel's diverticulum in a hernial sac has been frequently referred to by various writers and observers. Morgagni and Littre each report a case of this kind in a scrotal hernia. Meckel himself, and since his report, many writers have mentioned and alluded to the possibility of its occurrence. Cazin, in the dissection of the scrotal hernia, describes a diverticulum found in the sac. Duplay and Reclus, also Ludwig and Tilling, have published in their surgical works and papers instances of umbilical hernia containing Meckel's diverticulum.

The hernias in which the diverticulum has so far been exclusively found are those of the umbilical and inguinal variety and especially in the congenital type of the umbilical, or in the funicular hernia if there is a predisposing factor for the retention of Meckel's diverticulum in the hernial sac. According to Ahlfeld, the congenial umbilical hernia is caused by an abnormal thickness of the vitellointestinal duct which prevents the recession of the intestine into the abdomen, thereby giving rise to the formation of a hernia. The portion of the intestine attached to this duct is in all cases the last to enter the abdominal cavity, and, therefore, when Meckel's diverticulum is present, and such a hernia exists, it is to be found among the contents of the intestinal protrusion.

To this class of congenital umbilical hernia belong the many instances of Meckel's diverticulum patulous at the navel, for in these cases the diverticulum is invaginated into the umbilical ring and during the deligation of the cord its extremity is severed from the rest of the process. The intestinal coils which are found within the rupture of the inguinal region or an acquired umbilical hernia are as is known those possessing the longest mesentery. Elongation of the mesentery results from an actual increase in its length or from a ptosis of this structure. This was first pointed out by Richter to be an important factor in the causation of

hernia. Anatomically the longest mesentery is possessed by the lower ileum or by the same intestinal coils which are generally the site of Meckel's diverticulum when present. The fact that the lower ileum possesses the longest mesentery can be referred to embryologic development—that is, to the umbilical flexure in which the omphalomesenteric duct is found at the height of the convexity in the intestinal loop, which portion is already at this time attached to the longest mesentery. At this point, moreover, the mesentery may still be further elongated by retention of the intestine within the cord beyond the normal period so that when recession does occur the mesentery is of abnormal length. In the further development of the gastrointestinal tract this increased length may be retained and there is then established one of the primary predisposing factors for the causation of a hernia, which, when occurring, has among its contents Meckel's diverticulum if this should exist.

Usually the diverticulum is found within the hernial sac in conjunction with the intestinal coils to which it is attached, more rarely the diverticulum is found alone with the hernia. There is, then, what may be termed a true hernia of Meckel's diverticulum. Such a case is reported by Dowse in a female aged 77 years, in which an artificial anus had formed in the right groin. At a postmortem three months after the formation of the fistula a direct inguinal hernia was found whose sac contained a diverticulum which arose from the lower part of the ileum. Its distal extremity was adherent to the anterior side of the sac to the extent of half an inch. The diverticulum itself was funnel-shaped, its widest end about two-thirds of an inch in diameter being at the ileum and was connected with the bowel almost exactly opposite to the mesenteric attachment; it measured one and one-half inches in length and was pervious throughout; and its coats were similar to those composing the walls of the ileum. Its mucous membrane was well marked and corrugated, having several oblique folds or valvuli conniventes of a small size. The orifice of the sac lay to the inner side of the obliterated hypo-

gastric artery so that a direct inguinal hernia existed. The fecal fistula which had resulted had probably been produced by the fecal accumulation and distension of the diverticulum which was followed by ulceration and perforation. Although in this case no mention is made of Meckel's diverticulum, it seems most probable from the description given that this was the structure involved. Of congenital umbilical hernia which contains Meckel's diverticulum the following cases have been reported:

Schroder gives the case of Muller who, in a dead born fetus eight months old, found an umbilical hernia which contained a blind Meckel diverticulum one-half inch long and which was adherent to the neck of the sac.

Ahlfeld reports the case of a girl who died immediately after birth which was slightly premature. She had an umbilical hernia which contained a diverticulum, one to two inches long, whose extremity was adherent to the umbilical ring. A persistent omphalomesenteric artery running along the side of this diverticulum was also found. This artery lost itself in the mesentery of the small intestine near their junction.

Braus in a child seven years old found a protrusion at the umbilicus which measured 8 cm., had a pedicle and was but incompletely reducible. Upon opening the tumor a Meckel's diverticulum was found which was excised. Gluck, in a child born at seven months with an umbilical hernia and which had signs of peritonitis and strangulation, found that these symptoms had been caused by an accessory mesenteric fold bound to a diverticulum of Meckel and passing over the intestine. A radical operation for umbilical hernia was performed, both the diverticulum and mesenteric fold were resected.

Duchamp reports a case of umbilical hernia in which operation was decided on as the hernia sac was found thin and transparent but quite reducible. Just as the operation was about to begin the sac suddenly burst and the intestine rolled out *en masse*. Among the intestinal coils the cecum,

appendix, sigmoid flexure and a Meckel diverticulum two centimeters long and adherent to the hernial sac by its extremities were found.

Rosenblaum describes a case in which a persistent omphalomesenteric duct was found during the course of an operation for the radical cure of an umbilical hernia.

Hallet gives the instance of a girl two hours old who had an irreducible hernia at the umbilicus the size of a fist. At the operation the contents of its sac consisted of the cecum with its appendix, the small intestine with an adherent Meckel's diverticulum. A radical operation was performed and the appendix and the diverticulum were removed.

Tiedeman as quoted by Roth found in a full-term male with a double cleft palate and harelip and an accessory finger on both hands an umbilical hernia the size of a walnut. Its contents were an intestinal loop, pyriform cyst 14½ lines in length, seven lines in width and which had a pedicle or canal three and one-half lines long, attached to the convex margin of the gut. The cyst contained a yellowish fluid and communicated through the canal with the lumen of the gut. Tiedman thought this cyst to be the true umbilical vesicle, by Roth it is regarded as an enterocyst within a hernial sac.

Carle reports a case in which, in an umbilical tumor, a hernia of Meckel's diverticulum was diagnosed. The operation confirmed the diagnosis. When the sac was opened a small tumor the size and form of a strawberry partly reducible appeared. Its summit was pierced by an orifice, which led into a canal nine centimeters long and from which a clear fluid with a fecal odor oozed out in abundance. At birth the child, according to the mother, was attached to a short cord about the thickness of a man's thumb.

In inguinal hernia the diverticulum, although more rarely found, has been noted in the following instances: According to Morgagni, Benovoli has described a hernia which was constituted of an appendix to the ileum, and extended into the scrotum, although it communicated with the intestine by an

orifice which, in the dead body, was not larger than a middling-sized filbert, yet, during 15 days, the patient vomited everything he took into his stomach, and at an early period of the disease threw up matter which resembled excrement. The ileum, to the extent of half an ell, at the part corresponding with the hernia, was not of its natural color, and was exceedingly corrugated and contracted.

Morgagni then himself describes a case which came under his observation, an inguinal hernia containing an incarcerated diverticulum: A porter 50 years of age, and broken down with constant labor, had a hernial tumor in the right groin, the size of a man's thumb. Sometimes it apparently vanished, but about the middle of March, 1706, without any obvious cause, he was seized with pain in the abdomen. The pain, though wandering, was so severe that he compared it with canine gnawing. On the sixth day he was brought into the Hospital of St. Mary de Morte. His skin was nearly cold; his pulse exceedingly frequent and small nor did it offer but slight resistance to the fingers, but it struck them with unequal force. The whole abdomen was distended like a drum, especially below the right hypochondrium, where the coils of the colon could be distinguished by the hand. The hernia was exceedingly tense, but was not the principal seat of his pain. He vomited his food, and voided no feces, nor could he even expel flatus. He died in the evening of the ninth day.

Dissection: The omentum was found extending into the hernia, and, with the exception of some broad transverse lines, it was generally reddened by inflammation. The spleen exhibited a morbid lividness, which penetrated a considerable depth into its substance. The stomach, and the tract of small intestines, as far as the hernia, greatly distended with a yellowish matter resembling fluid excrement. The large intestines were contracted and white, and it was evident that nothing had passed through the part of the ileum connected with the hernia, although merely a process of the intestine crossing the orifice entered the sac. This process was consti-

tuted of a projecting portion of the parietes, and was in the form of a semioval cavity, the larger axis of which, where it commenced gradually from the intestine, was about three digits in the longitudinal direction of the intestine; but the smaller axis was much less. From this commencement it progressively contracted and extended to the length of an inch. This portion, therefore, whether denominated a cavity or a diverticulum, was the only part of the intestine contained in the sac, with the extremity of the omentum. Neither of these parts, however, could be withdrawn, not only from constriction in the orifice, but also in consequence of a fibrous adhesion to the sac. The sac itself was formed by the peritoneum, which protruded at the outer side of the spermatic vessels and on each side there existed an enlarged inguinal gland. That portion of the intestine which was contiguous to the sac, but more especially the diverticulum, was of a red color, inclining to lividness; and from this part to the stomach the coats of the canal were reddened by their turbid and crowded vessels, and the mesentery presented a similar appearance.

According to Thompson, Little describes a case in which Meckel's diverticulum four inches in length was found in a scrotal hernia of a man 48 years of age. Thompson reports the case of a colored man 50 years of age, with a left inguinal hernia, which had been at no time reducible and had been present for about 10 years. On the day previous to that on which he was seen, it had occasioned him some trouble, and he had reduced it himself after attempting to do so for three hours, the rupture then entirely disappearing. During the night serious symptoms appeared and in the morning the abdomen was somewhat tender and swollen on the left side. He vomited at intervals of about half an hour. The pulse was 120 and the temperature 101-2° F. On opening the hernial sac, free fetid gas, intestinal contents and semi-purulent fluid was discharged. The sac was entirely emptied and the internal ring was free. Upon prolonging the incision upward toward the anterior superior spine, fecal matter and

pus were also evacuated from the abdominal cavity in great quantities. An unsuccessful search was next made for a perforation among the intestinal coils which were matted together. Death occurred shortly after. At the autopsy which had been allowed only through the operation wound, perforation was found at the base of a Meckel's diverticulum, which sprang from the ileum 39 inches from the ileocecal valve. The rent was two centimeters long opening completely into the alimentary canal. At the apex and along one side were evidences of old peritonitic adhesions which had probably bound it down firmly to the wall of the hernial sac.

Dugan gives the case of Vance which was that of a delicate male child, who had a reducible inguinal hernia which became irreducible and strangulated. The usual operation for this condition was performed, strangulation having existed for six hours. The contents of the sac proved to be two coils of intestines ileum projecting through the ring with a Meckel's diverticulum wedged in between them, thus making reduction or taxis impossible. The diverticulum measured at least seven centimeters in length; its lumen was as large as that of the gut. The usual steps for a radical cure were gone through, with the result being satisfactory. Banks, before the Liverpool Medical Institution, February 8, 1896, showed a Meckel's diverticulum which he had removed from the sac of a hernia, the small bowel being also present. It is not stated whether this was an umbilical or inguinal hernia.

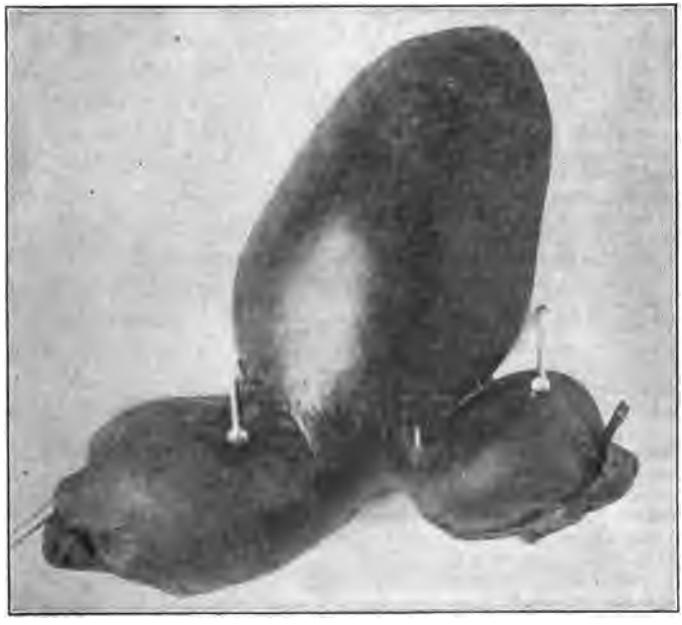
Webster reports the following case: In a woman aged 42, who had fallen a few days before, a distended abdomen and a large tender mass in the left inguinal region, occupying the inguinal canal, was found. Partial reduction was possible, but a hard mass looking like intestine was discovered and on carefully opening the intestinal ring and separating the adhesions this was found to be Meckel's diverticulum proceeding from close to the mesenteric border of the ileum, having a well-defined mesentery of its own. The

mesentery was tied off and the diverticulum removed close to the ileum and the opening of the bowel, which was of a sufficient caliber to admit the tip of a finger, closed by a double row of Lembert sutures. The diverticulum measured three and one-half inches in length. The intestinal lumen was continuous for about three inches, the diverticulum ending in a mass showing some old inflammatory thickening. There was a good deal of inflammatory thickening of the ileum surrounding the diverticulum, showing that that portion had been constricted in the inguinal ring. The operation was completed by suturing the rings for a radical cure of the hernia. The patient made an uninterrupted recovery.

To these cases I wish to add the report of a case of strangulated hernia in which the contents of the sac consisted only of a rather large Meckel's diverticulum and a portion of the wall of the small intestine to which it was attached:

The patient was a male laborer, aged 23, who was admitted to Cleveland City Hospital January 28, 1902, suffering from evident pain in his right groin and from frequent vomiting. Twenty hours previous to his admission to the Hospital, while lifting a heavy box, he was seized with a severe pain in the right inguinal region accompanied by a sudden tumor formation. This had never appeared before according to the patient's statement, but as he was not a very intelligent man reliance could not be placed on his statement. Vomiting soon set in and persisted at frequent intervals until upon admission to the Hospital it was distinctly fecal in character. Examination showed the patient to be suffering from shock, the abdomen was much distended and the hernial tumor occupied the upper part of the scrotum and extended back along the inguinal canal. Under general anesthesia the hernial sac, which was very tense, was opened up and found to be filled with a dark, bloody fluid and what appeared to be a single knuckle of the intestine, resembling more a moderate-sized gall-bladder. The peculiarity of its shape led to the pulling out of more intestine from the hernial ori-

fice, and it was found to be a diverticulum six centimeters long by four centimeters in width. It was sharply constricted at its neck where a portion of the ileum had been pulled down into the sac and seized by the constricting ring. The diverticulum and adjacent portion of the ileum, as shown in the photograph, were black and apparently at the



Meckel's Diverticulum, removed January 29, 1902, at Cleveland City Hospital

point of gangrene. Exposure and hot applications did not affect the color, and being afraid to return it I decided to resect the intestine, removing about 10 cm. of the intestine on either side of the diverticulum and uniting the resected ends by a Murphy button. The gut was then returned to the abdominal cavity and the operation completed by the Bassini method. The wound healed without suppuration and no special symptoms developed. The patient left the

Hospital March 31, 1902, able to resume work. The button had not yet passed.

BIBLIOGRAPHY

Albers.
Allen—*The Journal of Anatomy and Physiology*, 1882, XVII, 59.
Ahlfeld—*Archiv. for Gynecology*, 1875, VIII, 368, also Vol. XI.
Banks—*Lancet.*
Braus, Samuel—*Klin. Vor.*, 1898, No. 77.
Buzzi—*Virch. Archiv.*
Barth—*Deutsche Ztschr. Chir.* 1887, p. 198.
Carle—*Lyon Med.*, 1900, 296.
Cazin—*Arch. Gen.*, 6 Sec., 1868.
Clarkson and Collard.
Coues—*Med. & Surg. Rep.*, Phila., 1866, XV, 142.
Duchamp—*La Loire Med.*, Nov. 15, 1887.
Dowse—Trans. Path. Soc., London, 1874, 5, XXVI, 107.
Dugan—*Pedriatics*, 1896, Vol. II, p. 78.
Fitz—*Am. Jour. of Med. Sc.*, LXXXVIII, 30.
Gluck—*Berl. Klin. Wchschr.*, Jan. 19, 1885.
Hallet—*Rev. de Gynecol.*, June, 1900.
Heisler—Text-book of Embryology, 1899.
Leichtenstern—Ziemsens Enc. of Gen. Med., Vol. VII, 1876.
Lamb—*Am. J. Sc.*, Vol. 105, 1898.
Lockwood—*Brit. Med. Jour.*, 1897, II, 459.
Kern—*Beitr. z. Klin. Chir.*, Vol. XIX, 1897.
Kammerer—*Annals of Surg.*, 1897.
Morian—*Arch. f. Klin. Chir.*, Bd. 58, 507.
Neuman—*Festschr. R. Virchow*, Berlin, 1901.
Mitchell—*Jour. of Anat. and Phys.*, XXXII, 675.
Meckel—*Handbuch d. Path. Anat.*, 1812.
Thompson—*Annals of Surg.*, 1898.
Tiedman—Die kopflosen Missgeburten.
Tillman—Text-book of Surg.
Tillman—*Deutsche Ztschr. f. Chir.*, XVIII, 162.
Treves—Intestinal Obstruction, 1901.
Shepard—*Arch. of Pedriatics*, Vol. 9, 1892.
Schroeder—*Ueber die Divertikelbildungen im Darmkanal.*
Rokitansky—Path. Anat. Vol. II, 1850.
Rosenblaum—Altona, 1898, 8.
Vance—*Pedriatics*, 1898, 1172.
Vaughn—*N. Y. Med. J.*, 1896.
Roser—*Arch. f. Klin. Chir.*, XX, 1876, 475.
Webster—*Annals of Surg.*, April, 1902.
Roth—*Virch. Arch.*, LXXXVI, 377.
Hemmeter—Diagnosis of the Intestines, 1901.
Dennis—System of Surgery.

Traumatic Ostitis of the Ulna and Treatment by Operation

By Joseph Robertson, M. D., Steubenville

The case to be reported was perhaps more correctly one of osteoperiostitis. A lady, aged 37, came under my care in March, 1903. She had been married four years. A year later, she began to have a dull aching pain on the ulnar side of her right forearm; in a short time a more acute pain in the tissues supplied by the ulnar nerve and its branches. She then consulted a physician who thought it a case of neuritis, and treated it as such, but with only partial relief. The physician referred to, died, and several months elapsed before my attention was called to the case. I treated her for a time and concluded she had a diseased ulna. The forearm was somewhat swollen and was warmer to the touch than other parts of the body, but her general temperature was normal. There was no discoloration. There were three spots more sensitive, and slightly elevated, located over about the middle of each third of the ulna on the most superficial aspect.

She was taken to the office of Drs Floyd and Miller where an X-ray examination was made which showed the bone to be very much enlarged, and while the bone was not more curved than normal at the lower fourth, the hypertrophy gave the arm a curved appearance. A skiagraph was then taken of both forearms placed side by side for the purpose of comparison. This showed the shaft of the bone to be nearly three times greater in diameter than normal.

The symptoms were constant pain, worse at night, so that it was impossible to sleep, and her appetite was poor. She had lost much flesh and was very nervous and discouraged. She gave no indication of any constitutional disease and had not had any acute disease for a period of 10 years. At that time she had typhoid fever. She gave a history of repeated injuries to the ulna in close succession.

Between three and four years previously, or a short

time after she was married, she fell down a flight of stairs bruising the ulnar side of her forearm. Following that accident the same part was again bruised by the falling of a refrigerator lid, and several times after that she struck her forearm against the edge of a stove leg in mopping the linoleum, so that the same portion of her right forearm was kept constantly bruised until the dull aching pain was established.

Having ascertained these facts, together with her symptoms and the enlargement of the bone, it was feared that there might be a necrotic focus or that there might be a formation of pus, and if so there might be infection of the bones having a common circulation, should this condition continue, and taking into consideration her low physical condition and the fact that she was steadily growing worse, she was taken to the Gill Hospital where, with the assistance of Drs Floyd and Miller, the following slight operation was done:

An incision four and a half inches in length was made over the course of the ulna, the middle of which corresponded to about the middle of the shaft of the bone, and over the most sensitive spot at that time. The periosteum was separated from the bone a half inch in width and five holes were drilled through the compact tissue and medulla and a mortise was made at the center of the incision; some dark-colored blood oozed from the openings. A strip of iodoform gauze was placed in the wound which was closed by silkworm gut sutures, except at the upper end which was left open for the protrusion of the drainage; the latter was removed each day for two weeks and more gauze introduced, when the wound was allowed to close.

The operation was made for insight to see whether pus could be found or anything that would show the true condition, and was, in a sense, preliminary to more radical work if necessary. Relief from pain resulted and continued as long as the wound remained open, but as soon as it was closed the pain returned and was soon as bad as ever.

On August 20, 1903, she was again taken to the same hospital, and with the same assistance, the following operation was performed:

The incision was carried over the most superficial aspect of the ulna from a half inch above the articular end at the wrist to within a half inch of the base of the olecrauon process; the periosteum was separated from the bone five-eighths

of an inch in width, and with chisel and mallet the compact tissue was removed the entire length of the incision, and with the curet all of the medulla and a portion of the cancellous tissue at each end was removed, leaving not more than one-half of the bone. Iodoformized candle wick was laid in the bone and the soft tissues were brought together by means of 28 silkworm gut sutures, except at each end which was left open for the candle-wick drainage to protrude. The wick was removed each day and new wick drawn in, gradually diminishing the amount for six weeks when the wound was allowed to close.

From the latter operation up to the present time, a period of nine months, she has been free from pain, her appetite became vigorous and she has gained 16 pounds in weight, is enjoying good health, and has been doing her own housework for the past five months.

The tissues presented the following appearances: The periosteum was very thick and strong, light grey in color and tightly adherent to the bone; the compact tissue was thick and hard; the surface of the bone was rough and rasplike; the medulla was dark in color. There was no microscopic examination, but to the naked eye there was no pus nor necrosis.

The pathology of osteoperiostitis is understood. The operation was similar to that of others, so that this report is made, not because the operation or the condition is considered unique, nor because of the favorable results which have followed up to the present time, but first, for the purpose of adding to the list a case of general hypertrophy of a long bone resulting from injury.

It is not difficult to find literature on hypertrophy of bone resulting from diseases such as tuberculosis, syphilis, rheumatism and typhoid fever, or localized enlargements from other causes, but it is different when we seek for much light on the subject of general hypertrophy of the long bones resulting from traumatism.

The scarcity of reports of such cases seems to indicate

that they are rare as compared with the exposure to injury of the long bones, especially those of the forearms and legs, or these cases have not been regarded as worthy of notice.

The cause of such a condition should be sought in order to arrive at a proper conclusion, so that we may resort to intelligent methods of treatment. The diagnosis is not easy, from the fact of the difficulty in getting a true history of traumatism, and because the various diseases which are etiologic factors in the production of so many of the pathologic conditions met with in the osseous structures are so common that they can scarcely be excluded. If the weight of evidence is in favor of trauma as the cause, we cannot rest perfectly assured that there is not another factor.

Second: This case illustrates that a large portion of a long bone may be removed when the function of the periosteum has been so developed, and the remaining portion continue to live and be useful. In the removal of the medulla, an important element in causing the hypertrophy and pain was eliminated and the long continued drainage was maintained in order to make the operation more radical, by depletion of the periosteum, and hindering for a time at least the process of regeneration.

A Resumé of Clinical Results of Operations on the Kidneys, With a Report on the Newer Methods of Diagnosis

By Wm. E. Lower, M. D., Cleveland

One year ago at Dayton I had the pleasure of presenting a paper before this Association on some of the newer methods of diagnosis in surgical diseases of the kidneys. Today I desire to present a resumé of the clinical results along this line. I believe it is becoming universally conceded that other methods than examination of the urine for albumin is necessary to determine the excretory efficiency of the kidney. However, before banishing an old method

it is necessary to know that the new is better and more reliable. The evidence rightly demanded for every new procedure in a medical or surgical line is clinical evidence. The newer methods referred to in this report are: (1) the obtaining of the urine from each kidney separately, preferably by catheterization of the ureters, but when this is not possible, by some reliable separator; (2) by ascertaining the molecular concentration of the urine and the blood. This is done by freezing. Since the inauguration of these procedures a number of other methods have been suggested and tried. The most recently discussed is the method of Wright and Kilner, in the *London Lancet,* of April, 1904.

A standard quantity of normal red corpuscles, suspended in a measured volume of salt solution of a standard strength, furnishes a test fluid. The urine, or as the case may be, the blood fluid (serum), from which that urine is derived, is mixed in progressive dilutions in a capillary tube with measured volumes of the standard suspension of red blood-corpuscles. The point is determined at which the urine or serum has been so far diluted as to allow of complete hemolysis of the standard of red corpuscles. From these data, taken in association with the data obtained on diluting the suspension of corpuscles with progressive dilutions of a decinormal sodium chlorid solution, the concentration of the serum and urine is calculated. The quotient obtained by dividing the latter by the former is denoted "the excretory quotient." I know nothing of this method from personal experience, but at first glance it does not seem an especially easy procedure.

Another method recently extolled by Voelcker and Joseph *(Munch. Med. Woch.,* December 1, 1903), and again in the *Deut. Med. Woch.,* of recent date, consists in administering indigo carmine in 16 centigram doses hypodermically into the gluteal muscles. It is considered harmless and is supposed to be excreted solely by the kidneys. A cystoscope is introduced into the bladder and the excretion watched from each ureter. The relative rate of discharge

of this colored urine from the ureters is supposed to determine the corresponding secretory function. This seems to have a very wide range of uncertainty. The authors acknowledge that it is not practical in sacculated bladders. It, at best, cannot be very exact.

It is quite natural that we should desire some simpler methods to replace the more difficult one of catheterization of the ureters, but as yet none have been discovered. The number of cases included in this report is 71, divided as follows: Male, 49; female, 22. The oldest female was 65, the youngest, 19. The oldest male, 59; the youngest, 19. Of the females, both ureters were catheterized at the same time in 21 cases; only one ureter, once. Of the males, both ureters catheterized in 29 cases; only one ureter, in 16 cases. Urine separation other than catheterization of ureters, 4. The separator used is the Luy's. Anesthetic: general in three; local by the use of 4% eucain, 44; by use of cocain, 14; no anesthetic, 10. The examination was made at my office in 31 cases, at the hospitals in 37, at residence, three.

The purposes of the examinations were: (1) to determine the status of the kidneys in that class of cases in which there are no objective symptoms, but subjective symptoms referable to the region of one or both kidneys; (2) for differential diagnosis in the presence of tumors in the kidney region, and particularly tumors or inflammatory conditions in the right hypochondrium; (3) to establish the presence and the condition of a second kidney, when the other is known to be diseased; (4) to ascertain the patulency of the ureters; (5) to compare present conditions with former or to note progress. Under the first division are included 29 cases. In none of these cases could it be positively stated from the symptoms present or from the examination of the bladder urine that there was or was not a diseased condition of the kidneys. In a number of these cases the value of the method lay in the positive exclusion

of the kidneys as the seat of the trouble. I shall not give a detailed history in any of the cases referred to.

Case 42 is a striking example. In this case a young woman, aged 19, has had pain and rigidity in the left side, the pain extending well up under the ribs, some temperature, no cough. No tumor could be detected; the spleen was normal: catheterization of ureters showed equal amounts and no pathologic elements in the urine. The patient left the hospital and returned later with a more diffuse pain, extending over the abdomen, and exploratory laparotomy showed tubercular peritonitis.

Case 29, female, age 22, gave a history of pain which was referred to the kidneys; urination was frequent; a surgeon was called to operate on the kidney. Cystoscopy and catheterization showed practically normal urine from each kidney, but a pronounced cystitis. After cure of the cystitis the pain in the kidneys, which was evidently a referred pain, entirely disappeared.

In a large percentage of this class of cases one or both kidneys showed pathologic conditions, some so markedly that operations were done later and the diagnosis verified. In Case 56 the ureteral catheterization saved a patient from operation for a supposed appendicitis. A male, aged 33, for a number of years has had pain in the right side radiating over the abdomen and into the back. When the pain was acute, there was always intestinal disturbance, distention and generally constipation, tenderness all over the right side; no tumor and absolutely no external evidence of any kidney lesion. The diagnosis was a probable appendicitis. I was asked to see the case; I did a catheterization of ureters and found a difference of .20 in freezing point of the two sides and quite a number of leukocytes on right side. The lesion was diagnosed as being of the kidney; an X-ray picture was taken and a stone was demonstrated in the pelvis of the kidney. It was removed and all symptoms promptly subsided.

A number from this class improved or were cured by

urinary antiseptics and regulation of diet and habits. In none of this class, to my knowledge, has the decision formed by these methods been reversed.

Under the second classification for differential diagnosis are included 15 cases. The importance increases with this class for it is here that errors in diagnosis may bring serious consequences. That the greatest difficulty often arises in making a differential diagnosis in tumors or inflammatory masses in the right hypochondrium, I need only refer you to the writings of any clinician of large experience. When you consider that the gall-bladder, the appendix, the head of the pancreas, the hepatic flexure of the colon, the pylorus, and the kidney are all situated within or near that region, you will at once appreciate the difficulty that may arise in making a diagnosis.

The cutting down upon a pyonephrosis, supposing it to be a gall-bladder, or mistaking an intermitting hydronephrosis for a gall-bladder are only too common mistakes when catheterization of the ureters is not done. In this classification the value of ureter catheterization is best shown by referring to some of the cases.

In Case 22, a male, aged 64, there had been a long history of nephrolithiasis. With each attack of renal colic there was severe pain and vomiting, requiring large doses of morphin for relief. On January 18, 1903, he had an attack of colic and passed the stone on January 19. On February 24, he had an attack of severe pain not unlike previous attacks, but at this time the pain radiated more over the abdomen and was especially severe in the stomach. It required one-half grain of morphin to relieve him. After the effects of the morphin had worn off there was much soreness, especially in the right side. With the exception that the pain did not subside as suddenly it was not unlike the previous attacks of renal colic. On the third day after the onset of the attack he passed a renal calculus. This, however, did not give him relief. He developed a temperature of 100° to 101½.° A mass formed in the

right groin extending well up the side. The diagnosis rested between an abscess formed around an impacted calculus, or a lacerated ureter, and an appendicitis. Ureteral catheterization was done, both catheters passing freely and both sides secreting about the same amount of urine. Appendiceal abscess was diagnosed and verified a few minutes later by an incision and removal of a necrotic appendix.

Case 28, was that of a male, aged 21. A diagnosis of appendicitis and gall-stones had been made at different times. Catheterization showed the lesion to be in the kidney. An operation disclosed an infected hydronephrosis. The kidney was removed and complete recovery followed.

In Case 44, male, aged 31, a tumor in the left side extending well up under the ribs was present. Catheterization showed the kidneys to be negative. An exploratory incision anteriorly disclosed a malignant growth of splenic flexure of colon. There had been no symptoms of intestinal trouble.

Case 51, a male, aged 35, is of more than ordinary interest. The pain began in the back and extended down into the groin. There was vomiting and gastric disturbance. The case was diagnosed as renal calculus and sent to the hospital. A few days later by physical examination a tender point could be elicited in the appendicular region. Pressure on this point cause a referred pain to the stomach and also down the course of the ureter. Catheterization of the ureters was done; the specimens were examined, and the right showed leukocytes, red cells, hyalin and granular casts and renal epithelium; the other some albumin and hyalin casts. The great difference, however, was in the freezing-point of the two specimens, the right freezing at —.80, the left at —2.; a difference of —1.20.

The physical examination pointed so much to appendicular trouble in spite of the great difference in the urine that an operation was done for appendicitis and a diseased appendix removed. I could not account for the great differ-

ence in the urines, but after two days the whole situation was explained by the patient passing a rough renal calculus about the size of a large grain of wheat. This proved to be another case of renal calculus and appendicitis at the same time. I am not able to establish any relation between the two conditions in this case nor in the other similar case, and must for the present simply consider them coincidences.

Under classification three, determining the presence and function of a second kidney, is where the surgical calamities occur; *i. e.*, operating upon a known diseased kidney without knowing the presence or condition of a second kidney. Under this head Casper has recently analyzed Israel's cases, and he unhesitatingly declares that many of the fatalities might have been prevented if the more recent tests had been known and applied at the time. Out of nine "kidney deaths" four, at least, were directly due to the removal of the kidney when the remaining kidney was already fatally compromised. Even in his last series of 80, he had five deaths, while none occurred in Casper's series of 72 cases, operated on after he had determined the functions of the remaining kidney. His record to date is 88 cases operated on by various surgeons, and the findings of the test were confirmed by the operation in every instance. The kidney stated to be diseased by the test was found to be diseased, and the kidney proclaimed to be sound was found sound. When intervention was undertaken contrary to the findings of the test, nine of the 80 patients died, and in the seven autopsies that were allowed none of them could by any possibility be called a kidney death. In three other cases the test showed partial or complete absence of function in the second kidney and the autopsy later showed contracted kidney in one, and in the third the absence of a second kidney and an amyloid degeneration of the other. In my own series under this classification, operation was advised against in two cases and both died of nephritis a short time after, thus avoiding a sure surgical death.

In Case 40 there was a large pyonephrosis on the left side and some pus from the right side, but the freezing-point of the right urine was —1.56 and of the blood .56. An operation was done and the case made a complete recovery. A letter a few days ago from this patient states that he is again at work, which he has not been able to do for nearly three years. It is almost one year since the operation and the remaining kidney is giving no trouble.

In Case 31, a tubercular kidney was removed as a result of the test, and after a year the other has remained free and is performing its function perfectly.

Case 58 is most striking and brings out an important feature. In this case in which there was a suppurating kidney on the right side, due to kidney stone, and a difference in the freezing-points of the two sides of —.50, in a patient who had been a heavy drinker and who had a daily urea elimination of less than half the normal, there was, however, a freezing-point of the blood of —.56. On the strength of this test, in spite of the low urea elimination, a nephrotomy was done, a number of stones removed and the kidney drained. He made a splendid recovery and is now on a tour abroad. Had we depended upon the old test of urea elimination he would not have been operated upon.

Case 71 has some interesting points. A male, aged 47, gave a history of pus in the urine for some time. Lately there developed a tumor in the right side, which was unmistakably the kidney. There was great pain in the right side; no pain or enlargement on the left side. He was sent to be catheterized to ascertain the condition of left kidney. To our great surprise most of the pus came from the left side. In this case both kidneys are diseased, but the left the more. An operation is under advisement.

Case 38, a female, aged 59, was operated on for stone in the kidney. A nephrectomy was done and this stone removed, which was the largest kidney stone I have ever seen. We have not lost a case nor had any bad symptoms

following operation since the adoption of this method of testing the second kidney.

Under classification four, ascertaining the patulency of the ureters, there are two cases, Cases 39 and 60. In one I established the patulency of the ureters, and in the other I demonstrated the involvement. Under classification five, comparing conditions and noting progress, are included five cases, one, No. 46, upon whom a nephrotomy had been done six months previously. At that time there was a difference of —.70 in the freezing-point. At this examination the freezing-point was precisely the same. No. 66, which was Case No. 58 under classification three, in which there was the low urea elimination and the difference in the two sides of only —.26. The freezing-point of the urine has no special value unless comparisons can be made, and for that reason both ureters should be catheterized at the same time if possible.

It is quite positively known that the kidneys secrete the same amount and kind of urine in a given length of time if both are equally healthy. This has been demonstrated clinically and experimentally. I shall be able to show this experimentally very conclusively I think at a later time.

Tuffier's case recently reported, in which all the urine from one kidney passed through a lumbar fistula and from the other kidney into the bladder, showed conclusively that the freezing-test in this case showed the proportions of the functional conditions to remain the same even if only a small quantity of urine was used. There are a number of conditions that will influence the freezing-point of the urine and must not be lost sight of in making the tests. The most important is the ingestion of large quantities of liquids. H. Koeppe has shown in an extensive research on testing the functioning capacity of the kidneys, that when large draughts of water are taken, the greater variation occurs in the healthy kidney; that is to say, when a kidney does not show much of a variation from the freezing-point

of the blood, even after copious ingestion of fluids, then we may safely assume some disturbance in the apparatus in the kidney, which has charge of the production of diluted urine. This he believes to be the glomeruli. On the other hand we may assume some disturbance in the apparatus which has charge of the concentration of the urine when the variation in the freezing-point of the urine is never greater than that of the blood. This apparatus is assumed to be the epithelium of the kidney.

Kummel, who has done the most extensive work in the freezing of the blood, reports 228 operations. He reviews the information to be derived from cryoscopy, and states that since these new functional diagnostic measures have been introduced his mortality has been reduced from 16.8% to 6.4%.

My own results thus far have been extremely satisfactory. I am deeply indebted to the general profession and especially to my associate, Dr Crile, for the interest they have shown in this work, and for the opportunities they have given me to demonstrate many of these tests. I am quite sure that these methods will come more into use when the profession are better acquainted with the results.

DISCUSSION

Dr C. M. Harpster, Toledo: I am much interested in the use of the cystoscope. I prefer the Nitze cystoscope, because I am used to it, and I think it the best I have seen. I prefer to have the bladder distended with water instead of air.

I wish to call attention to the fact that in tuberculosis of the kidney the orifice of the ureter is prominent and stands gaping open. This is due to the pathologic urine and was first called to my notice in the clinic of Professor Nitze, Berlin. The normal ureteral orifice is slit-like, and an entirely different picture is presented.

I wish to cite three cases verifying this important point. Subjective symptoms pointed to tuberculosis of the kidney. In two of the cases cystoscopic examination showed the gaping condition of the ureter on one side, and subsequent removal of the kidney in each case proved the diagnosis. In

the third case the prominent, gaping orifice of the ureter was found on both sides, and operation was refused. In a few weeks the patient died. Postmortem revealed tuberculosis of both kidneys.

The diagnosis must be based principally on the cystoscopic aspect of the orifices of the ureters. In incipient cases they are still normal; in the more advanced, the diseased side of the bladder shows the influence of the pathologic urine.

I wish to emphasize Dr Lower's point, the necessity of catheterizing both kidneys, and of paying due heed to the amount of urine in cases of marked variation in the amount between the two kidneys. Particular attention should also be paid to the escape of urine outside the catheter. In some cases catheterization of the ureters causes a reflex polyuria, which may prove misleading in the functional tests.

While a little foreign to the general subject of the paper, I wish to give the history of a peculiar case:

An old German woman, 60 years of age, suffered from frequent micturition, voiding her urine every 15 or 30 minutes, day and night. She was greatly emaciated from the continued pain and loss of sleep. Many procedures had been employed by myself and other physicians.

I advised cystoscopic examination and found a shrunken, thickened bladder. Gradual dilatation of the bladder with water, using the Janet syringe, relieved the woman, and she is now robust and healthy.

Dr Horace J. Whitacre, Cincinnati: I rise chiefly to compliment the author of this paper on his magnificent presentation of this extremely important subject. It is certainly a subject which will interest every practitioner of medicine, because it represents great accuracy in the diagnosis of these obscure cases. My experience in the functional diagnosis of the kidney has been limited; yet, insofar as it has gone, my results seem to bear out the statement of Dr Lower completely. I never operate on any case in which the kidney enters as a possible factor without catheterizing the ureters. I should like to ask one question relative to blood in the catheterized urine. In a considerable percentage of my cases I have found blood in the catheterized urine of both the diseased and sound kidney when blood had not been present before. I should like to know whether Dr Lower considers the catheterization responsible for this

hemorrhage. I have never seen an infection of the ureter follow catheterization. In reference to the segregators, I would like to state that this method has been very unsatisfactory in my experience and that I have never obtained a result by this method which has seemed to me satisfactory.

Dr J. F. Baldwin, Columbus: I have never used personally the ureteral catheter, but I have had it used for me on a number of occasions by others. I have used the segregator a good many times, and have found it quite satisfactory. This instrument can be used by any nonexpert, which is not true of the ureteral catheter. Dr Lower, as we all know, is an expert in its use. In one case at Columbus I timed him, and he had a catheter in each ureter in one and one-fourth minutes from the time his cystoscope entered the urethra; but on the other hand, I have seen him work much longer than that, and finally fail, and I have had other experts fail also.

With this, as in other fields, we need experts with constant experience to render them skilful. I cannot always send to Cleveland for Dr Lower, and I am trying to get an energetic young physician in Columbus to become an expert in this line, and I think he is making very satisfactory progress in this direction. If the bladder is washed out beforehand, and if there is no infectious disease of the bladder, and this can be determined by the cystoscope, there will be practically no possibility of any infection with the catheters. The danger under any circumstances is slight, but some cases have been reported of such infection.

The use of the wax-tipped catheter, as recommended by Kelly, for determining the presence of stone in the kidney, must certainly fail in very many cases. In my own practice, I am satisfied that the majority of stones which I have removed from the kidney by operation could not have been detected by the catheter, owing to their lying outside the reach of that instrument.

I have found the radiograph very satisfactory in the diagnosis of these stones, and also of stones lodged in the ureter. While this test is not infallible, I am coming to depend more and more upon it in establishing a diagnosis.

After I have studied a case with sufficient care to feel justified in making a nephrotomy, or a nephrectomy, it is my invariable custom, unless there are some positive contraindications, to open the peritoneum at the site of my

incision, and carry the gloved hand across so as to palpate the opposite kidney. If, to the touch, that kidney seems normal, and if I have no reason to think it otherwise by the previous examinations, I then have no hesitation in proceeding with the operation, after closing the opening in the peritoneum.

Some of the other matters that the Doctor alludes to in his paper are still under consideration and must be for some time. We are not yet certain that they are going to be of any real advantage to the surgeon. We must not forget, however, while resorting to these diagnostic refinements, that there are other methods of examination by which much may be determined in regard to the kidney. The Doctor alludes to cases in which diseases of the gall-bladder have been mistaken for appendicitis. It seems to me that if the surgeon will only remember the relationship of the colon to the gall-bladder and appendix, he will be able to differentiate a very large number of these doubtful cases. The gall-bladder, as we know, lies above the transverse colon, and if diseased or inflamed, whether distended or not, the tender spot will be above the colon, and the colon may be brought into prominence, if necessary, by being distended by forcing in air through the rectum. The kidney lies behind the colon, and the colon can be demonstrated lying in front of it. The conditions must certainly be very abnormal and rare in which, after careful study of the colon, there should be any mistake in diagnosis between a diseased gall-bladder and a diseased kidney.

I remember one case in which a southern surgeon had made a diagnosis of either inflammation of the gall-bladder or appendicitis. He was in doubt as to which condition was present, and so made his incision nearly a foot and a half long in order to catch them both. He found both organs entirely healthy, and so closed the incision. Fortunately, the patient recovered. Had he used the ureteral catheter, the separator, or even tested the mixed urine, he would have found that there was serious disease of the kidney, and had he studied the relationship of the patient's tender spot to the colon, he would promptly have eliminated both gall-bladder and appendix. Her case was a very typical one of pyonephrosis, resulting from a large stone in the pelvis of the kidney, and was promptly cured by a nephrectomy which I made a few months later.

Dr Wm. E. Lower, Cleveland, closing discussion: Regarding the use of the segregator, I can only say that in the case recently reported, by Kummel, and a more recent one by Crile, it failed absolutely, for it indicated urine on the side from which the kidney had been removed. Secondly, it is a very painful procedure. The use of most of the segregators is much more painful than the cystoscope and besides, if you do succeed in getting a separation, you have no way of knowing as to whether or not the pathologic elements come from the bladder or from the upper urinary tract. If it requires a cystoscope to determine this, why not use the catheters at the same time?

As to the use of the X-ray, I have had only a limited experience with cases in which it was used. In one case it showed most strikingly the stone in the pelvis of the kidney, in which the diagnosis could not positively be made, but in another case I operated on the positive findings of the X-ray as against the negative findings of the cystoscope and found that the cystoscopic examination was the correct one, for there was no stone where the X-ray seemed to indicate there was.

Replying to Dr Whitacre's question regarding the blood, I wish to say that in a great number of cases there is some blood after using the catheter, and allowance must be made for this. A very slight traumatism of the urethra may produce some bleeding, and in many cases you can find some red cells after catheterization. I depend more upon the concentration of the urine of the two sides in determining the conditions. I have never known any case in my series to be infected by the catheter. Sometimes catheterization, as Dr Baldwin has called attention to, is so easy that you can do it without any effort and in a very short time; again it is very difficult and requires a much longer time, and occasionally it is absolutely impossible to do it. I can never say in advance that I will succeed, but in the majority of cases I can pass it. Occasionally a general anesthetic has to be used. As to mistakes in diagnosis in the right hypochondrium, I dare say that so well recognized a clinician as Dr Baldwin would not be so likely to make a mistake, and yet statistics do show many errors in this region.

Some Considerations of Empyema

By Mark Millikin, M. D., Hamilton

The condition known as empyema is no doubt often confused with other states of the lungs which have similar symptoms. How often is a diagnosis made of delayed resolution when really it is an effusion? I venture to say that many an abscess of the lung is primarily due to an empyema which has broken into a bronchus.

The general practitioner sees these cases first as a rule. Inexperience and timidity on his part may lead him wrong. He will look for such signs as flatness, bulging of the intercostal spaces, egophony, absence of the vesicular murmur, and will probably not find them. An effusion is a very easy thing to get muddled on. He should learn a lesson from the abdominal surgeon, who bears good naturedly the opprobrium of being first a cutter and then a diagnostician. The lesson to be learned is not to pay too much attention to signs, but to tap and then make a diagnosis. Even though it be a consolidated lung, we have good authority for puncture as a remedy in delayed resolution.

Now if you have been able to withdraw a little pus, you no longer belong to the class of mediocrity. Aspirate at once with a large needle while your fame is in the full. Very rarely indeed is an empyema cured by aspiration, though it is good preliminary treatment. The real treatment consists in drainage. Most authorities advise the insertion of as large a tube as possible, even though it be necessary to make a resection of a rib. Some surgeons advise putting in two tubes.

No doubt good results have followed such treatment, but every now and then some one comes forth with a scheme to assist in the expansion of the lung. Many years ago somebody put a tube in the chest and let the other end hang in a pail of water under the bed. He thus got siphonage and a negative pressure in the abscess cavity. The objection to

this method was that the patient must remain in bed, or else carry around a vessel of water. Hutton has devised a drainage tube with a nipple valve in its external end which allows pus to run out during expiration, but no air to enter during inspiration. Andrews, of Chicago, plugs the end of the tube after the patient has made several strong expiratory efforts, and claims that negative pressure thus results for several hours. In the Leipsic clinic they have used a kind of water-pump for the same purpose. A deflated Politzer bag has been attached to the tube. The bag in tending to expand sucks out fluid from the chest.

The mere fact that men return again and again to this phase of the treatment of empyema, *viz.,* expansion of the lung, is proof that they are not satisfied. The surgeon who does a Schede operation or decorticates must ask what might have been had the lung expanded rapidly in the early days of the disease.

There is no other abscess in the body like an empyema. No other abscess varies its pressure 20 times a minute; or drains up hill if given a chance; or is bounded by the most compressible organ of the body on one side and on the other by a rigid frame; or has such large cubic capacity. Its walls, already lined by endothelium, may encourage the persistence of a fistula, and at the same time they may become immensely thickened. When these facts are considered, the importance of prompt, appropriate treatment is clear.

Some 20 years ago, my father, Dr Dan Millikin, had a case of empyema and treated it in the following way: After aspirating, with the needle still in place as a guide, push a narrow bladed knife along side of it and make an opening big enough to just admit the end of a large catheter. The opening should be so small that the catheter will fit tightly in the wound. A little air may enter the chest at this time, hut that does no harm. Attach the external end of the catheter to the aspirator bottle and withdraw as much pus as you safely can. Then wash out the cavity with a little less

fluid than the amount of pus withdrawn. Draw off again and repeat the process of washing out as many times as you wish. Finally aspirate off all you can, clamp the catheter with a hemostatic forceps, and keep the tube close to the body by means of adhesive plaster. The next day, or sooner if you desire, attach the aspirator to the catheter, suck off the fluid, and wash out. By this method, without once removing the tube, one is enabled to gauge the amount of pus from day to day, to wash out the cavity and to encourage expansion of the lung. Washing out is not sanctioned by many authorities, because it may carry infection to the remote parts of the pleural cavity; but if less fluid is thrown in than is abstracted, I fail to see where harm results. I have usually used a weak bichlorid or formalin solution. After a few days granulations form about the tube, and while the latter slips in easily enough, no air enters along side even though the negative pressure within is quite low. Two other advantages of this method may be mentioned. There is no gruesome wheezy gurgle to bother the patient. It is certainly cleaner than a mere drainage tube. Pus may ooze along the side of the catheter and soil the dressings. True, it is better out than in, but my experience is that in a few days the lung has so expanded that there is little room for pus. Some of the advocates of a simple drainage tube make much of this pus. They contend that when the dressings around the tube are thoroughly saturated they act as a valve and to some extent at least prevent air entering the pleural cavity while not interfering with drainage. Children should be encouraged to blow soap bubbles, or blow colored water from one bottle to another through connecting tubes. There are some noisy toy horns and whistles which at such times could be put to good use. It is advised to place the patient in a loosely hung hammock, the diseased side down. The sound side is thus made concave, and compressed; the diseased side convex, and given a chance to expand. Adults should be instructed to make strong expiratory efforts with the glottis closed. When an open tube is in the chest, air

enters the pleural cavity, as well as the lung. With the drainage tube clamped air enters both lungs but not the pleural cavity. Then when the patient makes strong expiration with closed glottis, air may, to some extent, leave the sound lung and inflate the diseased one. This, in brief, is the philosophy of the treatment of empyema. There are some other things to consider. When you make negative pressure in the pleural cavity the vessels lining it must have a tendency to dilate. The lymph currents must be somewhat altered. What effect has this on the taking up of toxic substances? Surely it does not predispose to their absorption.

Recently I have gone over three patients treated by my father and here give results:

L. B., had pneumonia in September, 1882, on the right side. An empyema developed and he was treated by aspiration, etc. He went to work in June, 1883. *Present condition:* Circumference of chest 37 inches; expansion 2¾ inches; difference between the right and left sides at level of the nipples, 3 inches. The vesicular murmur is slightly less on the right side. His general health is very good.

H. G., aged about 40, was treated this way in April,1889. After some time he found it necessary, for economy's sake, to go to a neighboring town. The aspirator was loaned to him and he presented himself to his doctor with a note explaining the method of treatment. Though the doctor was confined to his room suffering from a fatal malady, he took so much interest in the scheme that he treated the patient until he was pronounced well. His present condition is as follows: Expansion 3½ inches: no difference between the two sides in circumference, vocal fremitus or vesicular murmur.

S. B., was two years old when she had pneumonia. An empyema developed and she was treated for about five weeks in the above-mentioned way. Now, 11 years after, the two sides of the chest are the same in every particular.

H. Z., a little girl about four years old, had pneumonia. The temperature became normal in a few days, and then more fever followed. A large amount of purulent fluid was aspirated as preliminary treatment. She died in two days. An autopsy showed the lung contracted to the size of a lemon, and the pleura gray and shaggy. Pneumococci in

great numbers were found in the pus. This was my first case, and it taught me a lesson, which in the following cases I have ever had in mind.

J. S., aged about 35, had pneumonia on the right side in February, 1901. His temperature reached normal in about 10 days, but the flatness remained. Pus was found and a large amount was withdrawn about March 1. He was treated daily by aspiration and washing until May, when, under chloroform, I enlarged the opening which was between the ninth and tenth ribs, and put in a large tube. At that time I was not aware of Hutton's observation that the last part of the lung to expand is in the axillary line at the sixth intercostal space. Pus continued to flow in small amounts. In July, his face and legs swelled, and the urine contained albumin and casts. The swelling gradually subsided, the albumin became less and in September he went to work in the shop with a tube still in his chest. At this time you could pass a uterine probe in the direction of the right apex for fully nine inches. He consulted a prominent Cincinnati surgeon at this time who advised the resection of three ribs. This advice was refused and he came to my office every evening to have his long fistula washed out and irritated, in the hope that healing would result. In January, nearly one year after his attack of pneumonia, the opening, for reasons best known to itself, closed. His present condition is as follows: Urine free from casts or albumin, of normal specific gravity; there is no difference between the circumference of the two sides; vesicular murmur is somewhat diminished, possibly on the right side; expansion of the chest is two inches. He recently secured life insurance.

Two years ago I saw a young man in consultation. Very little history was obtainable, but he had a pleura full of foul-smelling pus, a large amount of which was withdrawn, and a tube inserted. His condition was so serious that we were not surprised to learn of his death in 24 hours.

H. W. had pneumonia on the left side in February, 1904, and at the time of my first call had been sick five weeks. He said that the doctor had told him that this was "still some pneumonia there." He was treated according to the method advocated in this paper, and eight ounces of pus were aspirated. For about one week he was under my care; when tiring of the rather strenuous treatment and fearful of the suggestion that he enter a hospital, he dismissed me

and returned to the easier methods of homeopathy. He is now on the street free from a tube and happy that he got away from me.

DISCUSSION

Dr Horace J Whitacre, Cincinnati: There are a few points I would like to make in connection with Dr Millikin's paper. I cannot agree with the author in his advocacy of drainage through an intercostal space, since I believe firmly that the removal of a section of rib is essential to good drainage. He objects to the use of a wide incision and large drainage tubes, because he cannot seal the cavity. The cavity can be tightly sealed by means of a "doughnut"-shaped disc which is now manufactured by the rubber companies and will fit any tube. This disc is sealed to the chest by means of zinc oxid adhesive plaster, and there is absolutely no trouble. A large tube passed through a disc of this sort will give efficient drainage. The depth of the tube can be accurately shortened and, if desirable, air can be excluded.

I would like to make just one suggestion regarding the irrigation of the cavity. Recently I have had some cases of empyema in children and have irrigated the cavity by placing the patient in a bath-tub filled with normal salt solution. As the patient expires and inspires the salt solution goes in and out of the chest as it would with a syringe and the cavity is thoroughly washed. I think that I would never use an antiseptic solution for such irrigation. The after-treatment of empyema is, to my mind, extremely important. I believe that it is essential to remove the drainage-tube after the discharge has diminished to a small amount of sero-purulent fluid. I have seen both fever and discharge kept up for a long time by the continued use of a tube. The encouragement of expansion of the lung has been dwelt upon by Dr Millikin. I have found Dr Osler's suggestion, in reference to this point, extremely valuable. He has suggested that the patient sit on a chair and grasp the round with the hand of the well side; then take deep inspirations while in this position. It will at once be apparent that this position immobilizes the sound side of the chest and throws the burden of expansion on the diseased side.

Dr Mark Millikin, Hamilton, closing discussion: The main point that I wanted to bring out is the difficulty with which they breathe, because of the weak negative pressure

within the thoracic cavity. I believe some device can be applied to the chest which will assist in increasing the negative pressure within the pleural cavity.

The Diagnosis and Treatment of Hernia

By Jesse McClain, M. D., Coshocton

When the mere fact is mentioned that about one in every 10 of the civilized people of the earth are ruptured, sufficient apology has been offered for asking your attention to a few practical observations upon the diagnosis and treatment of an amenable condition which is neglected more, perhaps, by the general practitioner than any other surgical ailment.

While there is, perhaps, nothing new to say upon this all-important subject, there is much that will bear repetition; and since the limited time at my disposal will not permit me to go into the symptomatology of the different clinical varieties of hernia I shall only attempt, so far as diagnosis is concerned, to point out some of the more important points in the differentiation of inguinal hernia from those conditions which simulate it and for which it is so often mistaken. When members of our profession are found applying a truss to a varicocele or an undescended testicle, tapping the tunica vaginalis for a scrotal hernia, or injecting a decoction of white oak bark into an inflamed inguinal gland—and these are actual and lamentably frequent occurrences—is it not time that the attention of the general practitioner should be directed to the anatomy of the inguinal region and the differential diagnosis of the abnormalities found in those parts?

The conditions which may be mistaken for an incomplete inguinal hernia are many. I shall notice only those most frequently found, such as undescended testicle, hydrocele of the cord in the male, hydrocele of the canal of Nuck and cysts of the round ligament in the female, various tumors, glandular, fatty and others, inflamed inguinal glands, psoas abscess, and tuberculosis of the cord.

The presence of an undescended testicle is readily diagnosed by the absence of the organ from the scrotum on the affected side; hydrocele of the cord, or of the canal of Nuck and cyst of the round ligament are recognized by the tense, cyst-like character of the swelling, absence of impulse, and by the fact that they are not reducible, or rarely so. If reducible at all, they will disappear slowly as compared with a hernia. It must not be forgotten, however, that hydrocele and hernia may both be present on the same side. The writer has found this condition present in several cases operated upon. In doubtful cases the diagnosis can be easily verified, without risk, by aspiration with a hypodermic needle.

Varicocele does not fluctuate, but may have an impulse on coughing. Swelling commences in the scrotum, is not translucent and is dull on percussion. In some cases of omental hernia the differentiation is very difficult. The characteristic feel of a bundle of worms and the peculiar impulse, when this exists, aid in the diagnosis.

In psoas abscess, the various tumors, and inflamed lymphatic glands, the diagnosis must rest largely upon the character of the tumor, its anatomic relations, and the history of the case.

The conditions which are most frequently mistaken for a scrotal hernia are hydrocele, hematocele and inflamed testicle. Hydrocele is rarely reducible, is translucent, has no impulse, and the swelling commences in the lower part of the scrotum and seldom extends into the inguinal canal. Orchitis, next to hydrocele, is the source of the greatest number of errors in diagnosis. The nature of the swelling and the history of the case as to specific infection or injury should exclude errors in diagnosis. A history of injury can always be elicited in cases of hematocele.

Treatment of Reducible Hernia: Most writers still advocate the mechanical treatment of hernia in children, but admit that fully one-third so treated are uncured. Even in cases apparently cured the congenital sack remains, and Hamilton Russell contends that so long as this exists the

hernia cannot be considered cured. He regards the presence of the congenital sack as the sole cause of oblique inguinal hernias, and many are coming to believe that this condition is at least a strong predisposing factor in the causation of many of the hernias of later life. Stiles advises against the use of a truss in a large proportion of these cases. Owing to ignorance and carelessness of parents it is often unsatisfactory, and if there is any difficulty in keeping the hernia up he operates—even if the child is only a few months old. Infants bear the operation remarkably well, and both in childhood and youth radical treatment gives the best results, both as to mortality and permanent cure. Lilienthal reports a baby eight days old successfully operated upon for strangulated hernia, and Erdman reports an operation for strangulation in an infant 13 days old, no anesthesia being used. The writer knows of no statistics bearing upon the question of recurrence of congenital hernias apparently cured by mechanical means, but has no doubt that if such statistics were available they would show a large percentage of such recurrences. If a congenital hernia is not cured by mechanical means during the first year of life, the writer believes that the best interests of these patients are conserved by the surgeon who advises the radical operation, for he can see no reason why these patients should be subjected to the constant annoyance and ever-present dangers incident to a condition so amenable to surgical treatment.

Treatment of Reducible Hernia in Adults: In the treatment of the reducible hernias in adults, the use of the truss can never be more than palliative. What, then, is our duty toward these patients? In my opinion the physician falls short of his manifest duty if he fails to use every effort to induce these patients to submit to a radical operation. They should be taught that this is an essentially surgical ailment and that the danger from operation is practically *nil* in the hands of a careful surgeon. A patient with appendicitis is told that he carries in his belly a charge of dynamite which is liable to explode at any moment. Too often the man with

a hernia is supplied with a truss and sent on his precarious way. These patients need not be told that a truss is a source of perpetual annoyance, discomfort and expense, but they do need to be told that the false sense of security conferred by the wearing of a truss is a deceitful snare and a dangerous delusion. I would not exclude from surgical treatment the extremes of life, only cases in which some physical condition precludes operation. Even cases in which, for any reason, a general anesthetic cannot be given, the operation may be done under local anesthesia. In cases of very large hernias the operation is apt to be attended with much difficulty and considerable danger, and relapse is more likely to occur.

Modern surgery has placed at our command the means of permanently curing over 90% of operable cases. It only remains for us to awaken a ruptured people to a saving knowledge of the resources of our art.

Treatment of Irreducible Hernia: Whatever differences of opinion exist as to the advisability of surgical interference in reducible hernias, there can be no question as to the necessity of operation in all cases that are irreducible, whether they be obstructed, strangulated, or both. There is, however, a wide difference of opinion as to how much manipulation a hernia is to be subjected to before it is pronounced irreducible and brought to operation. If I have not been able to fix your attention upon any other point involved in the discussion of the subject before us, I shall feel that I have accomplished much if I am able to impress upon your minds the mischievous possibilities of so-called conservative treatment in these cases. Conservatism here alway means prompt surgical intervention. Only sufficient manipulation to enable us to determine the presence of obstruction or strangulation should ever be employed. The employment of even a moderate amount of taxis is, in the opinion of the writer, largely responsible for the high mortality attending these cases. If unsuccessful, it only adds to the irritation and swelling, and increases the constriction. If we succeed in returning the incarcerated bowel to the abdominal cavity,

we have no assurance that the obstruction or strangulation has been relieved, and too often we find that our apparent success has only brought disaster upon both surgeon and patient. No obstructed or strangulated hernia should ever be returned until the constriction at the internal ring has been relieved and the contents of the sack found to be viable.

The statistics given by A. E. Barker, covering 406 cases of strangulated hernia, show that the number of patients operated upon has doubled in the last 20 years. Of his 406 cases 127 died, 100 of these deaths being due to the condition of the returned bowel. The mortality in strangulated hernia operations in hospital practice is 20%, in private practice still higher. Compare these statistics with those of non-strangulated cases. In Carter's clinic at Rome there were two deaths in 1400 operations; at the Vienna clinic, three deaths in 804 operations, and Dr W. B. Coley reports a series of 1075 operations with three deaths, making a combined mortality of a little over one-fifth of one percent.

Warren reports that in his operations for inguinal hernia prior to 1895 he obtained 69% of permanent cures; in those following the year 1895, permanent cures were effected in 92% of his cases.

Selection of Operation: Several very excellent methods of operation for the radical cure of hernia have been devised, each having its advocates, and each, perhaps, open to criticism. They are all based upon the same general principles and the surgeon can make no great mistake whichever method he may choose. After once perfecting himself in his chosen method he should be slow to discard it for some other method with which he is not familiar. Whatever operation the surgeon can do, and do well, offers the best prospect of permanent cure.

Bassini's operation is undoubtedly the most popular now in vogue. It has been shown that 95% of all operations are done by this method. Halstead's operation as modified by himself differs but little from Bassini's and offers no par-

ticular advantage over the latter. Ferguson's semilunar incision method seems to be based upon scientific principles and has much to commend it.

Whatever method is chosen the most rigid asepsis should be observed. Ochsner says that the permanency of a cure depends upon a very few simple features:

1. The wound must heal primarily.
2. In order to prevent pressure necrosis, the stitches must not be drawn tightly.
3. The surfaces to be united must be free from fat and other unstable tissues.
4. The tissues should be manipulated with the greatest care during the operation.
5. The wound should be supported by broad rubber adhesive strips.
6. The patient should be kept in bed two or three weeks.
7. After the operation, abnormal intraabdominal pressure should be eliminated.

Before beginning an operation for strangulated hernia, appliances for doing a resection of the bowel should be at hand ready for immediate use. The recognition of gangrene in a coil of intestine lying before us is not always easy. If the strangulation has not lasted too long, the circulation is rapidly reestablished when the constriction at the internal ring is relieved. If the appearance of the gut indicate impending gangrene, hot laparotomy sponges should be applied for some minutes. If the circulation does not rapidly improve, an immediate resection should be done; and if this is not advisable an artificial anus should be established.

Under ordinary circumstances I believe an immediate resection to be attended with less danger than a secondary operation. Any one of several methods may be selected, but to one unaccustomed to intestinal surgery the use of the Murphy button commends itself as being both simple and expeditious.

Selection of Suture Material: Since the ideal suture material has not yet been discovered, each operator will continue to use whatever, in his opinion, gives best results. The writer uses No. 1, 20-day chromicized catgut for all suture material, doubling it when tying off the sack. My first Bassini operation was made entirely with fine silk, both for deep and superficial stitches.

After-Treatment of Hernia Operations: A temperature of ½° to 1½° is of no consequence. Look at the wound occasionally. The bowels should move in two days. In excision cases, enemas to move the bowels, and rectal alimentation for first week should be administered. Liquid diet in teaspoonful doses should be given occasionally. In uncomplicated cases, patient can ordinarily be propped up in bed in from four days to a week; out of bed in from two to three weeks. They should be advised to do no work for six to eight weeks, to wear no truss, but instead a broad abdominal support made of muslin.

Report of a Case: In conclusion I desire to report a single case illustrating the extent operative treatment may be carried in the aged. James F., aged 76 years, a shoemaker by trade, had suffered with an inguinal hernia for a number of years. While doing some heavy work he discovered that his rupture was down. After resorting to his usual methods of reduction for three days, he summoned a physician, with whom I was called in consultation. A diagnosis of strangulated hernia was made; an operation was decided upon and begun as soon as the necessary preparations could be made. After making the usual straight incision and carefully dissecting down to the sack, it was opened and found to contain one foot of the small bowel and a greater part of the omentum, both being gangrenous and emitting a very foul odor. The omentum was tied off in sections, the gangrenous portion of the bowel removed and the healthy bowel united with a Murphy button. I then completed a Bassini operation, using silk entirely for suture material. In spite of the patient's extreme age and feeble condition he made an uninterrupted recovery. As more than a year has elapsed since the operation, the patient may be considered permanently cured.

DISCUSSION

Dr Lester Keller, Ironton: It seems to me that the most important point in Dr McClain's paper is bringing out the fact that we should operate more often in the ordinary cases of hernia. I think within the last 10 or 15 years the surgeon has kept ahead of the general practitioner, and believe that we all, as general practitioners, should have it impressed upon us more thoroughly that radical operation is the best thing to do. I believe that as general practitioners we are prone to defer operation, because we think that it is more serious than it really is. I think statistics will show that it is about the most successful and least fatal of any of the larger operations.

Dr J. J. Thorne, Toledo: I don't think the reading of the paper sufficiently emphasizes the value of all the chances of recovery present for the old man. Neither do I think age ordinarily considered is a bar to the operation. I made a few important operations on a man 98 years and four months of age. Again, I have made 16 operations on children less than 48 hours old. I feel that a great deal of injustice has been done the old man; but the old man is not so dreadfully afraid of the operation. I am not afraid to operate providing the patient is reasonably well nourished. I presume I have done my share for a country surgeon, but I am averse to the continual use of the knife as it has been the last few years, and to see the surgeon go from one operation to another and forget entirely the last operation within a few hours.

I recommend that you pay more consideration to age, recognizing the fact that it is not a barrier against operation.

Dr W. J. Means, Columbus: I was glad to hear Dr Thorne emphasize the fact that there is no age limit for the radical operation of hernia. An individual is neither too old nor too young to be operated upon. The radical operation for hernia has come to stay. It is not a theory any more, but a fixed surgical operation. Statistics show that 90% of all cases of hernia can be permanently cured by a radical operation, a higher percentage than any other surgical procedure of similar gravity. It seems to me that if the general practitioner recognized this fact, the truss manufacturers would not continue to flourish as they do today, nor would the "rupture quacks" grow fat upon this class of cases.

In the last few years I have given the operative treatment of hernia considerable attention, not so much as to any special method of operation, but toward perfecting a technic in handling the tissues. It has been, I think, well demonstrated that permanent results depend upon a normal union of the tissues. To obtain this requires perfect coaptation and union by first intention. In cocain anesthesia we have an agent that has revolutionized the mortality of strangulated hernia. The use of this agent is not confined, however, to emergency cases. I have operated upon a large number of inguinal hernias of old standing under cocain anesthesia with gratifying results. The paper reflects much credit upon the writer.

Contusions of the Abdomen

By C. A. Hamann, M. D., Cleveland

Thinking that a consideration of the subject of abdominal contusions with their results would be of interest to the Association and would awaken profitable discussion, I have ventured to prepare this brief paper.

Contusions and wounds of the abdomen are comparatively frequent injuries. Every physician is liable to encounter them and grave questions of diagnosis and treatment come up.

Contusions of the abdomen are received in many ways, namely, by falls, kicks, crushes of various sorts, railway injuries, etc. Such contusions are frequently associated with other lesions which are more evident, such as fractures or dislocations; the symptoms of these other lesions may alone attract the attention of the observer, and hence it is that the visceral injuries are lost sight of.

The lesions sustained by the abdominal wall and the viscera are of all grades of severity, varying from slight bruises to the rupture of organs with fatal hemorrhage. A great deal depends upon the condition of the abdominal muscles as to whether the organs will be injured. That is to say, if the person is expecting the blow, the abdominal

muscles are contracted, and the force will be expended upon the abdominal walls, the muscles may then be ruptured; whereas, if the patient is not expecting the blow, the muscles are relaxed and then the viscera will be more liable to suffer. It is, furthermore, of importance to bear in mind that the size of the glandular organs, such as the liver and spleen, and the degree of distension of the hollow viscera, have a bearing upon the liability to rupture. An enlarged spleen, perhaps softer in consistency, is more liable to be ruptured than a normal organ; and a distended bowel will be more liable to be ruptured by being compressed between the anterior and posterior abdominal walls than an empty one. In times past, and it may be said of late years, the results of such injuries have been most unfortunate. The diagnosis has been in doubt; the courage to open the abdomen in pre-antiseptic times was lacking, and even now much valuable time is lost in temporizing; *early* operations only can avail as a rule. It is different with open wounds. One is more liable to *operate in these cases.*

Let us consider briefly the symptoms and physical signs produced by abdominal contusions:

(1) As is well known, shock is a very common symptom after these injuries. It exists in cases not associated with lesions of the viscera as well as with visceral injuries. The degree of shock is *no criterion* of the extent of the injury, for it may be as marked in contusions without visceral injury as with; indeed Curtis remarks that he observed shock more often and in more intense degree in uncomplicated contusions, and he refers to one case in which death occurred from shock alone. Nor is the duration of the shock a criterion. Ordinarily, shock lasts from one to three hours. If the constitutional symptoms persist longer than that, they are probably due to internal hemorrhage, or to peritonitis, and it is hard to differentiate between these conditions, and to say when one begins and the other ends. A patient may react from the shock and present no evidences of any lesion and still have a severe visceral injury.

(2) Temporary, partial or complete loss of consciousness is frequent, but is no criterion of the amount of injury sustained.

(3) Respiratory disturbances are encountered. The primary inhibition of respiration and dyspnea soon disappear.

The respiratory difficulty may continue, however. Frequent superficial respiration, thoracic in type, shows that instinctively abdominal breathing is inhibited; in cases in which this type of breathing occurs, there is some severe injury of the abdominal wall or of the viscera.

(4) The most conspicuous and most important symptom is that of *pain*. This pain varies greatly in character, intensity and position. The intensity of the pain is to a certain extent a criterion of the gravity of the injury. It is to be remembered that persons differ in degree of susceptibility to pain, and also that the shock may diminish it. The pain is usually most severe at the region of injury; however, it is apt to radiate over the entire abdomen. I believe that it may be stated confidently that severe, continuous, and localized pain is usually associated with an injury to the stomach or bowel, and that in these cases pressure increases the pain.

(5) Vomiting is more apt to occur in cases of injury to the viscera, particularly the hollow organs, than in simple contusions; it is also repeated in these cases. Distinction must be made, however, between the *primary* vomiting and that which is secondary to, and a symptom of a developing peritonitis. If there is an injury to the stomach there is apt to be hematemesis. Hiccough may be present.

(6) *Rigidity of the abdominal wall* is a most important sign of injury to viscera; it is but rarely seen in simple contusions. It is hard to say just why this rigidity occurs. It is not seen in cases of hemorrhage from rupture of a tubal pregnancy, and in other nontraumatic forms of hemorrhage. Probably the contusion of the abdominal wall and parietal

peritoneum, the efforts on the part of the abdominal muscle to inhibit abdominal breathing, and the inflammation of the peritoneum account for it.

(7) The presence of free gas in the peritoneal cavity can sometimes be demonstrated by percussion; that is to say, there is obliteration of the area of hepatic dulness. However, this loss of the area of hepatic dulness is not to be depended upon as a physical sign of intestinal rupture, for distension of the bowels may produce the same sign. Again, little or no gas may have escaped.

(8) The presence of fluid (blood) in the dependent portions of the abdomen can sometimes be demonstrated in cases of extensive hemorrhage.

(9) The pulse and temperature present nothing characteristic; immediately after the accident, of course, if shock exists, there are present the circulatory evidences and the depression of temperature associated with this condition.

(10) Marks upon the abdominal wall, hematomata, etc., may be present.

The symptoms and signs above mentioned are the ones met with right after the injury, or within a few hours. If there has been no lesion of a viscus the patient goes on to recovery. If, however, there has been rupture of an organ, the signs of hemorrhage, or of beginning peritonitis appear. These may be named the *secondary signs and symptoms.*

The evidences of hemorrhage are usually clear; the increasing anemia, the failure of the circulation, the presence of areas of dulness, etc., usually enable us to make a diagnosis of this condition. Peritonitis may begin in two or three hours. Its attendant symptoms and signs, fever, acceleration of pulse, abdominal rigidity, followed by distension, vomiting, hiccough, constipation, etc., are familiar, and will not, therefore, be discussed in detail. I will mention, however, that much more value is to be attributed to the rate and character of the pulse than to the changes in the temperature.

An examination of the blood may throw light on the condition. That is to say, there is usually a leukocytosis.

In the diagnosis of cases of injury to the abdomen, it is of considerable importance to *obtain a careful history.* The manner in which the injury was sustained, the force and direction of the blow or fall, the position of the patient, the condition of the abdominal muscles, the condition of the viscera (whether the stomach and bowels were empty or distended, normal or diseased) and the *sequence* of the symptoms should all be thoroughly investigated. Much aid may be obtained in this way in getting a proper appreciation of the case. Following this investigation into the history, there should be a careful physical examination. Here, as in the diagnosis of any condition, one *should think of all the possibilities.*

Can we differentiate between simple contusions and injury to the viscera? We cannot in many cases, for the symptoms and signs may in the first few hours after the accident be quite similar. In a general way, however, it may be said that the presence of continuous vomiting (perhaps of blood), severe, localized pain and tenderness upon pressure, together with *rigidity* of the abdominal wall point to an injury to a viscus. The signs of hemorrhage may be so definite as to leave no doubt in the mind of the surgeon. There are many cases, however, in which it is impossible to say whether any of the viscera have suffered injury; there is no pathognomonic sign or symptom. The perplexities of the medical attendant are great when brought face to face with the problems of diagnosis and treatment. In the first few hours after the injury, when the diagnosis is not clear, shall we temporize and await more clear indication for operative interference, or shall an exploratory operation be done? If there is rupture of an organ the delay will be dangerous, for it takes but a short time for peritonitis to develop, and when it has once gotten a good start, operation will be powerless to check it. Statistics all show that the early operations are by far the most successful. An exploratory operation may reveal the fact that there is no visceral lesion; it will then, of course, have been a needless proceeding.

It seems to me that it were far better to do a few needless operations than to let one case that could have been saved by early operation die through want of interference. If there are but slight symptoms, if localized tenderness and rigidity are wanting, if there are no signs of hemorrhage, then I would not operate. Again, I would not operate in the presence of profound shock.

It is not necessary at the present time, however, to seek evidence and to present arguments for the justifiability of an operation in intestinal rupture—everyone admits the necessity. What is needed is a method or methods by which one can recogniże the lesion and determine the proper time to operate. The symptoms are so variable, and so is the time at which they appear, that we must often remain in doubt until perhaps it is too late.

In a comparative study of cases of abdominal contusions with, *and* those without visceral lesions, Bottomley found that there was absolutely no one symptom which is pathognomonic; in other words, there is nothing which tells us positively whether the organs are or are not injured. There are cases which present pain, localized tenderness, and rigidity, and yet recover without operation.

In the presence of shock no diagnosis of a visceral injury can be made. Gradually increasing rigidity and change in the facial expression are two pretty reliable symptoms indicating visceral injury.

Le Conte estimates that of 100 cases of abdominal contusions entering a hospital, perhaps 30 or 40 will have received a grave injury demanding an operation, while 60 or 70 recover without. Curtis, in 1887, collected 116 cases, all of which proved fatal. However, not one of them was operated upon. Gage collected 85 cases that occurred since 1887; 45 of these were not operated upon and all died; 40 were operated upon, and of these 17 recovered, *i.e.* 42½%. Makins in 292 cases of abdominal injuries, without external lesions, of all grades of severity, found 89, or about one-third, in which there were visceral lesions. Newman col-

lected 132 cases, in 62 of which there were ruptures of viscera. The intestinal lesions may be produced by crushing, bursting or by tearing.

Case I: H. H., aged 40, a laborer, on February 2, 1903, fell upon the end of a railroad tie, striking upon the umbilical region. He vomited shortly afterward, and kept it up for several hours. The vomited matter consisted of the gastric contents, then a greenish liquid, and subsequently a black liquid, perhaps blood. He had great abdominal pain; also hiccoughed. He lay in a barn all night. On the fourth day after his accident he was admitted to Charity Hospital. His temperature was 100° F., pulse 96, and small. He had pain and tenderness in the umbilical region. There was moderate distension of the abdomen. He hiccoughed continually. There was a right inguinal hernia, which was tense and gave no impulse upon coughing. It was not tender. The patient's bowels had not moved since the accident. The area of hepatic dulness was obliterated. The abdominal walls were moderately tense. The hernia had been present for years but had always been reducible; since the accident it had been irreducible. I, of course, thought that the hernia, which was apparently strangulated, was responsible for his symptoms and advised operation. It seemed to me, however, that something further was wrong with the man. The contusion of the abdomen had to be taken into account; operation for the hernia was advised, but the patient was told that if the conditions found did not explain the symptoms, a laparotomy would be done at once. He refused to have anything done until the afternoon of the eighth day after the accident. He then gave his consent, and I made an incision over the hernia. A thickened and inflamed sac, containing clear fluid, but no bowel or omentum, was found. The neck of the sac was closed. Upon thrusting my finger into the peritoneal cavity through the neck of the sac, liquid feces poured out. I then opened the abdomen—found the peritoneal cavity full of liquid feces, and the peritoneum greatly inflamed. The appendix was felt for and found to be thickened and inflamed. It was hurriedly removed, the incision in the abdominal wall having been agumented by another one at right angles to the first one.

Upon inspecting the appendix it was seen to be normal in the interior; it certainly was not a case of appendicitis. Further search soon disclosed a ruptured coil of small intes-

tine from which liquid feces were escaping. The bowel was torn as far as the mesentery; after resecting about half an inch from each end, the ends were sewed together with a double row of sutures; the peritoneal cavity was washed out, the wound partly closed, leaving gauze drainage. The next day he felt better; there was some rise of temperature for a while, vomiting for a time, and hiccoughing for many days. The edges of the wound sloughed, but he ultimately recovered completely.

A second case, seen with Dr J. E. Cook, shows that it is possible to have a laceration of the stomach without involving the peritoneum.

Case II: A young man had been struck in the epigastrium by the end of the shaft of an ambulance. He was taken to the hospital and was found to be in profound shock. He rallied somewhat, however, upon the application of the usual remedies. In a couple of hours the pulse began to get weaker again, and he presented evidences of internal hemorrhage. His condition was such that we did not dare open the abdomen. A large intravenous infusion of salt solution was given and he improved a little. During the night he vomited over one and one-half quarts of blood. Dr Cook gave him another infusion and he gradually recovered. For some time there was epigastric tenderness, and more or less gastric disturbance, but he is now quite well.

In this case there was evidently a laceration of the mucous membrane, and perhaps of the underlying coats to the peritoneum; certainly the peritoneal coat was not torn, and the blood was poured into the stomach, from which it was subsequently ejected.

DISCUSSION

Dr Wm. E. Lower, Cleveland: This subject brought before the Association by Dr Hamann is one of more than usual interest. I am particularly interested in it because of the recent experience I have had in both contusions and penetrating wounds of the abdomen. More of my cases of penetrating wounds recovered than of contused wounds, upon which I have operated. I have had rather extensive and interesting experience with contused and penetrating wounds of the abdomen. Of eight cases operated on in a comparatively recent experience, four were contused and

four were penetrating wounds of the abdomen. Of the contused wounds three died and one recovered. The contusions consisted in one case of an ore bucket striking on the abdomen in its descent and grazing the anterior abdominal wall. Two days later an operation for peritonitis revealed a tear of the mesentery and a gangrene of a large portion of the small intestine. Another case, contusion was produced by falling against the end of a step. Operation showed perforation, general peritonitis, and death resulted. A third case, the contusion was caused by a piece of iron projecting over the end of a cart which a laborer was shoving. There was a sudden obstruction to the cart and the end was shoved against his abdomen. I saw the case on the second day. General peritonitis was present. Operation revealed a perforation of the small intestine. The fourth case was a rupture of the bladder. This was followed by recovery. The mortality in these cases, as you will note, was 75%. Of the penetrating wounds, three recovered and one died. A mortality of only 25%. Of the penetrating wounds, one was a gun-shot of the ascending colon; another a stab wound cutting off the gastric artery, the entire abdomen being filled with blood. Laparotomy was made, the artery tied, the blood washed out, and recovery followed. Another was a stab wound of the left lobe of the liver, the stilletto going entirely through the liver, causing a very profuse hemorrhage. The liver was sutured and the abdomen washed out; recovery following. The fourth was a gun-shot wound of the liver and duodenum in a very fat woman. This patient died. In all the penetrating wounds of the abdomen the operation was done early.

The reason for the great mortality in cases of contusions of the abdomen is the length of time that elapses before the operation is done. If there was some way of diagnosing the lesion in these cases there is no doubt we could save the most of them by an early operation. We are hardly in a position to advocate an operation in all cases of contusions of the abdomen, for some are so very simple that it seems as though no possible injury to the viscera could occur, and yet some of these very simple cases turn out to have the gravest lesions. I shall gladly welcome any symptom giving us early positive evidence of injury to the viscera.

Dr A. F. House, Cleveland: I did not have the pleasure of hearing the Doctor read his paper on the subject of Contusions of the Abdomen. Two weeks ago I saw a case that had no signs of traumatism, with the exception of a fractured right arm. There was absolutely no sign of any injury to the abdomen at any place. He was under profound shock, and complained of pain in the epigastric region. He died about 12 hours after arrival at the hospital, and the postmortem examination showed a ruptured bladder and extensive extravasation of blood, which was extraperitoneal, lying between the deep layers of muscles, the extravasation extending clear around the entire body. There were no marks of violence or discoloration of the skin. There was no fracture, except as already stated.

About four or five months ago a rougher in a rolling mill was brought to the hospital. His duties were to guide the billets as they passed through the rolls. Water is continually flowing upon the rolls, and blisters are formed as the billets pass through the rolls, and when these blisters explode scale is shot in all directions. In this case a large piece of scale penetrated the abdomen and lodged inside the stomach. The only visible sign present was an incised wound of the skin. It entered the peritoneal cavity about one and one-half inches from the place of entrance. It cut off the greater omentum at its attachment to the stomach and penetrated this viscus. A short time afterward he showed signs of internal hemorrhage. The abdominal cavity was opened, the steel removed from the stomach, the wound in stomach closed, the abdomen thoroughly flushed with a normal saline solution and the wound in the abdomen closed with drainage. The patient made a good recovery.

Pancreatitis

By Wm. J. Gillette, M. D., Toledo

Surgeon to Robinwood Hospital; Professor Abdominal Surgery, Toledo Medical College

Disease of the pancreas have been attracting a very considerable attention in recent years, and every effort is being made by careful investigators to clear up much regarding them which is as yet imperfectly understood. In this

direction the work of Senn, Korte, Osler, Opie, Robson, Moynihan, the Mayo Brothers, Reginald Fitz and others, has borne much fruit, and we are, without doubt, rapidly approaching a perfected knowledge of the symptomology, diagnosis, and treatment of the diseases of this organ; but much yet remains to be done before this greatly-to-be-desired end is attained.

Formerly a diagnosis of some form of pancreatic disease was made when an abundance of fat or striated muscle fibers was found free in the feces; this, coupled with sugar in the urine, made such diagnosis most certain. We now know, however, that any one or all of these conditions may exist and no discoverable pathologic lesion of the pancreas be present, and also that pancreatic disease may exist in some form, and no doubt frequently does, without the presence of any of these manifestations; also that when they do occur, a very considerable destruction of the gland must have taken place, or else interference with the flow of its secretion into the intestine.

Reginald Fitz in his article on the "Symptomology and Diagnosis of Disease of the Pancreas" in the *Boston Medical and Surgical Journal* of June 4, 1903, read at the Sixth Congress of American Physicians and Surgeons in Washington, D. C., May 12, 1903, says, "It is recognized that glycosuria and fat, with muscle in the feces, are more frequently absent in diseases of the pancreas than present," and further, "that the symptoms most useful in making diagnosis are those which call attention directly to the region of the pancreas: pain, tenderness, tumor and tension, with or without obstruction jaundice and evidence of interference with stomach motility." It is, however, fully recognized that a relation may exist between pancreatic disease, fatty stools, sugar in the urine, and undigested muscle fiber in the feces. The explanation for these varying conditions seems simple. When an obstruction to the flow of pancreatic juice into the intestine exists, none of it mingling with the food, fat and fiber are not absorbed, except imperfectly, and sugar is only

present in the urine when the islands of Langerhans are destroyed. It is perfectly evident that many cases of pancreatic disease must occur without either of the above conditions existing. Muller, in 1887, demonstrated that bile has much to do with the breaking up of fat in the intestine.

I have thought a report of the two following cases of sufficient interest to present here; they both emphasize the truth of the foregoing propositions:

Case I: In December last, I was called in consultation by Dr Lewis H. Bodman, of Toledo, to see Mrs M., aged 51, with the following history: Father died of Bright's disease, the mother's death followed "a severe attack of neuralgia"; there were no brothers or sisters. The patient has no children; she has never been pregnant; menstruation began at the age of 13, and ceased at 48, she was always regular and there was no pain.

At about time of cessation of menstruation, or three years since, the patient began to have pains in the epigastrium which she called "indigestion pains." These continued with more or less frequency with occasional vomiting until October 4, last, when she was suddenly, and without any warning, attacked with one so severe that she was greatly prostrated, and Dr Bodman was called, who found her with a weak and rapid pulse and suffering intensely. A large dose of morphin was required to relieve her. From this time she had fever varying from 99° to 103°. Vomiting became much more frequent and at one time, though late in the progress of the disease, was accompanied with hemorrhage.

Food gave little distress but could not be retained. At the time of my visit I found the patient in bed, and apparently suffering severely. On examination I found a large indurated area over the left hypochondriac space. Percussion here elicited a dull note and gave rise to much pain. There was a history of frequent chills. My diagnosis was that of a phrenic abscess, the result of a probable posterior perforation of the stomach.

I understand this indurated area disappeared soon after my visit, coincident with an attack of severe pain in that region and the appearance of pus in the stool, after which the temperature returned to nearer normal and her severe symptoms improved.

This lasted but for a short time, however, when there was a recurrence of vomiting and distress in the region of stomach, with chills and elevation of temperature. I did not see her again until February 4, following, and then in consultation with Dr Wm. A. Dickey, of Toledo. At this time the patient had lost much in weight, the temperature ranging again from 99° to 103°. There was now no evidence of the induration in the left hypochondriac space, but another had appeared above and to the right of the stomach. It was very prominent and evidently contained fluid of some kind. I advised an exploratory incision into it for the purpose of its evacuation, and with the hope, also, of making a more positive diagnosis. Dr Dickey concurred with this proposition and the patient was at once removed to Robinwood Hospital.

On February 6, in the presence of Drs Dickey and Bernhard Becker, and with the assistance of Drs W. W. Grube and H. L. Green, with the patient under mixed anesthesia, I very cautiously opened into the most prominent portion of the protruding mass. The route of incision passed through a portion of the left lobe of the liver (which was firmly adherent to the abdominal wall over it). One extremity of the incision passed through what seemed to be the gastrohepatic omentum. A pint to one quart of a dark, dirty grumous-looking fluid, giving rise to a rather disagreeable odor, was evacuated. It contained many large shreds of apparently broken-down tissue. A tube was now inserted to the bottom of the cavity left, which passed behind the stomach to the pancreas. This cavity was washed out daily for a period of six weeks, when the discharge ceased and the opening closed. For most of this time the discharge was very copious and the shreds of tissue contained resembled that of the pancreas. I was enabled to determine, through the incision made, that the stomach was firmly attached to this gland, and no doubt the pancreatic infection occurred by reason of a posterior perforation of it.

At the time of the operation, the urine was heavily loaded with albumin, but as she returned to health it disappeared. A chemical examination of the discharge did not reveal the presence of pancreatic juice.

The urine contained no sugar, but an abnormal quantity of fat, demonstrated both microscopically and macroscopically, was present in the feces, but soon disappeared. No great amount of striated tissue was ever shown to be present.

The vomiting gradually ceased and the stomach resumed its power of taking food. She was fed for two or three weeks exclusively by the rectum.

The patient was discharged from the Hospital April 6, 1904, and has since rapidly gained health and strength.

Case II: Mrs C. H., aged 24, was referred to me by Dr Clinton Coy, of Ridgeville, Ohio, in August, 1900, with the following history: Her father is living at the age of 70; her mother is living at 68 years of age, but had had paralysis six years ago; the patient has five brothers and one sister, all of whom are well. She has been married four years; menstruation began at the age of 15; she has always been regular, and menstruated a week before admission to the Hospital. The patient says she "has always had pain" in the left hypochondria, but was comparatively well, however, until six months prior, at which time food began to distress her and she vomited frequently; no blood, however, appeared. She lost weight rapidly and on admission to the Hospital was much emaciated and very weak. A diagnosis of some form of disease of the pancreas had been made by both Dr Harrison, of Napoleon, Ohio, and Dr Coy. The basis upon which such diagnosis was made by these gentlemen I have not been able to learn. At time of admission to Hospital she had a temperature ranging from 99° to 100° and a pulse-rate of 100.

On physical examination, the patient complained of extreme tenderness on pressure in epigastric space. An enlargement, rather indefinite in character, appeared below the stomach. The contents of stomach, after a test-meal, was examined, but gave no special information. The urine gave a slight trace of sugar but no albumin. Feces did not present anything unusual.

An exploratory incision was advised as it was evident that pathology of a serious nature was present.

On August 10, in the presence of Dr Coy, and with the assistance of Drs W. W. Grube and H. L. Green, I opened the abdomen by an incision four inches in length made in the median line above the umbilicus and extending to within an inch of it. The indefinite enlargement mentioned was now found to lie behind the stomach. It was reached through an opening made by tearing the gastrocolic omentum when the enlarged pancreas appeared studded with multiple caseous deposits, evidently tubercular in character.

The gland was nearly double its normal size. I observed no enlarged glands in the smaller omentum or at any point in the near vicinity.

As removal of the organ or even the portions containing the diseased tissue seemed inadmissable, I cauterized it very thoroughly with the Paquelin cautery, hoping some good might result. The abdomen was completely closed after uniting with catgut the tear in the omentum.

Recovery was prompt and without incident. She left the Hospital after four weeks, declaring herself much relieved.

Her stomach immediately began to retain food and at the end of the four weeks her appearance of improved health was very marked. The pulse and temperature soon returned to normal. A recent communication from Dr Coy is to the effect that her recovery from pain and stomach disturbance was prompt, but her strength and weight returned rather slowly, that she has, however, now gained many pounds and is doing her own housework (she is the wife of a farmer), and considers herself well in every way.

I have been unable to find recorded any considerable number of cases of tuberculosis of the pancreas. I had no precedent for dealing with the condition as I did.

Acute Hemorrhagic Pancreatitis, with Report of a Case

By J. H. J. Upham, M.D., and Isabel A. Bradley, M.D., Columbus

The year 1889 began a new epoch in our knowledge of the pancreas, not only as to the functional value of that organ in the normal animal economy, but also and more especially as to its important position in modern pathology. In that year the work of von Mehring and Minkowski, published more completely a few years later on the results of the extirpation of the pancreas, and particularly the address of Dr Reginald Fitz before the New York Pathological Society, in February (the Middleton-Gold-

smith Lecture), excited a wide-spread interest, and directed attention to this hitherto neglected gland, leading to investigations and observations which have been exceedingly fruitful in important results.

Since the ancient hypothesis that the pancreas was merely a cushion for the support of the stomach and duodenum down to modern times various theories have been advanced as to its *raison d'être*, and as to any diseases thereof most authorities, until very recently, practically ignored the subject, acknowledging the lack of knowledge and stating that the extreme rarity of such, if they did not occur, rendered them of no clinical importance. The possibility of its being the seat of cancer was indeed known, but was considered a pathologic curiosity to be recognized at autopsy. Clässen appears to be one of the earliest to suggest other morbid conditions; Fitz quotes him as far back as 1842 as endeavoring to demonstrate acute hemorrhagic inflammation of the pancreas as a distinct disease by the report and analysis of six cases. His conclusions, however, seem to have excited but little attention, for neither then nor for long afterward is there evidence that his deductions were at all accepted or any general interest aroused.

In the published lectures of Elliotson in 1844, of Dr John Bell in 1845, and of Dr Thomas Watson in 1846, all of London, the subject of the pancreas is summarily disposed of as being practically *terra incognita*. In this country Dr Geo. B. Wood, in 1858, stated that there was practically nothing known on the subject; he admitted the possibility of cancer and of a chronic cirrhosis of the organ to be occasionally recognized at autopsy. Austin Flint in 1866 and 1873 dismissed the subject briefly as of little importance owing to the infrequency of lesions of the gland and the obscurity of their diagnosis. Dr J. R. Wardell, of London, in 1871, in Reynolds System of Medicine, quotes Clässen and others in an excellent article, showing that some advances were being made, but emphasizes the extreme rarity of pancreatic disease. Virchow himself in 1884 stated that nothing was rarer than pancreatic hemorrhage and Fitz in

his critical review of the literature was able to collect but 70 cases of acute pancreatitis.

Nine years after the last named, however, Warthin wrote that he was able to find 103 cases reported since that time alone, and I have been able from recent literature to add 60 more to these, and doubtless there are still many others. An analysis of these reported cases shows the rather interesting fact that but 13 in all are tabulated as occurring before the year 1870; 13 more are to be found between the years 1870 and 1880; 44 between 1880 and 1889, while over 160 have been reported since that last date, showing that greater interest in the subject and more systematic necropsies demonstrate that while acute disease of the pancreas must still be considered uncommon, the fact remains that it does occur much less infrequently than was formerly supposed, and therefore considering the profound disturbance to which it may give rise, and the possibility in a few cases of affording surgical relief, it would seem that this organ is entitled to greater consideration and interest on the part of the profession in general. Pathologists have led the way and it now remains for clinicians and surgeons to test and verify their work. When one considers the treatise by Opie and the exhaustive lectures (the Hunterian, 1904) by Mayo Robson, one may appreciate the great progress that has been made in little over a decade. Of the several now quite well-established diseases of the gland, I will consider the one which with the exception of malignancy was probably the first to be described, but which still remains somewhat of a mystery, I refer to acute hemorrhagic pancreatitis, or, according to Mayo Robson, acute hemorrhagic parenchymatous pancreatitis.

Pancreatic disease so forcefully described by Fitz was divided by him into three classes, and this arrangement has remained practically unchanged as all cases seem to fall naturally into three groups according to the gross character of the pathologic findings: (1) hemorrhagic, (2) suppurative, and (3) gangrenous pancreatitis. Of these the suppurative and gangrenous or necrotic forms may be considered as secondary to the hemorrhagic,

and therefore the study of the etiology of all three groups resolves itself chiefly into the investigation of the causes of the first, and though much has been accomplished in this direction the question cannot be said to be positively settled as yet.

Fitz's conclusions were briefly: "Acute pancreatitis commonly originates by the extension of a gastroduodenal inflammation along the pancreatic duct. It may also be induced by the occurrence of hemorrhage, which in turn may be of traumatic origin, although usually arising from unknown causes. The pancreatic hemorrhage may likewise be secondary to inflammation of the pancreas." These views prevailed for nearly 10 years, supported by the finding in a number of cases of various bacteria in such inflammatory conditions which could readily have come from the intestinal tract. Opie quotes Körte and Osler as mentioning in 1898 the frequent association of gall-stones in cases of acute pancreatitis, and Lancereoux one year later as suggesting that a calculus in the diverticulum of Vater might favor such ascent of microorganisms.

A great many cases, however, have responded negatively to bacteriologic investigation and in such other explanation than infection must be sought. According to Opie again, Hlava in 1890 and Thirioloix in 1892 were able to produce experimentally more or less of a hemorrhagic pancreatitis by the injection into the duct of Wirsung of irritating solutions; the former being more successful with the use of an artificial gastric juice, offered the theory that in individuals with excessively acid gastric secretion some of the hyperacid material might be forced by antiperistalsis into the pancreatic duct and there bring about the inflammatory reaction. Flexner carried out these experiments more at length in 1900, using numerous irritating substances as weak solutions of hydrochloric acid, nitric acid, chromic acid, sodium hydrate, formalin, suspensions of bacteria, etc., and succeeded in producing hemorrhagic pancreatitis in many cases, associated with typical fat necrosis in some of them. The strength and amounts of the solutions employed by Flexner in his successful experiments would seem to make Hlava's theory

very unlikely, and no actual conditions have been found in human subjects in its support.

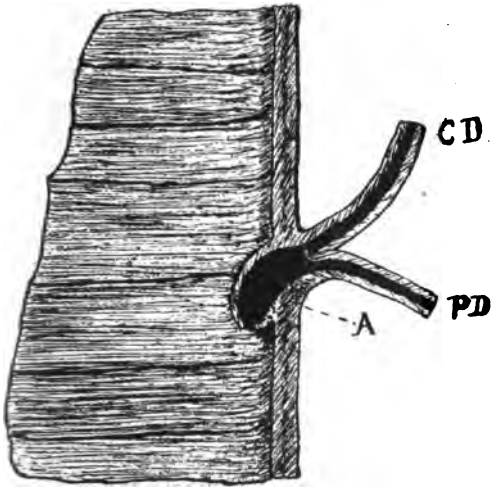


Diagram to show Ampulla of Vater with ordinary termination of common bile-duct (CD) and the pancreatic duct (PD). (Robson)

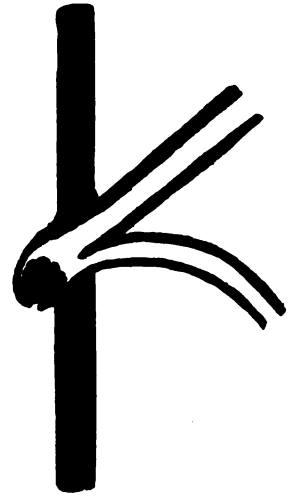
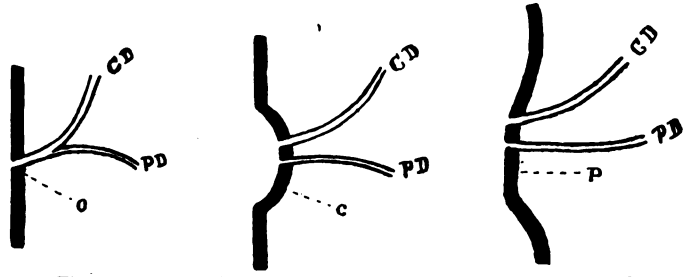


Diagram showing large diverticulum of Vater containing a small calculus so placed as to divert flow of bile into the pancreatic duct. (Opie)



Three other methods by which the common bile-duct and Wirsung's duct enter the duodenum. CD—Common bile-duct. PD—Pancreatic duct. O—Common orifice. C—Cup-shape depression in wall of duodenum. P—Papilla. (Robson)

The experimental work of Opie seems to offer much in the way of a solution of the etiology of a certain number of cases at least. This observer having witnessed a case of hemorrhagic pancreatitis in which a biliary calculus was found lodged " in

the common duct near its termination," and noticed the numerous occasions where in reports of cases the section protokol mentioned the association of cholelithiasis, viewed the coincidence from another standpoint than his predecessors; he rejected the suggestion of Lancereoux and, having in mind the experiments of Flexner, he conceived the idea that bile diverted into the duct of Wirsung by a stone lodged in the diverticulum of Vater might act similarly as a source of irritation. By painstaking experimental work with animals he seems to have proved the possibility of such activity of the biliary secretions, and in applying his theory to the human subject, has very ingeniously suggested explanations of various objections raised. He states that a large calculus lodged in the ampulla might completely fill it thus practically occluding the opening of Wirsung's duct; also, in a certain percentage of cases, 11 in a series of 100 examined by Opie, there may be separate openings into the duodenum of the bile and pancreatic ducts, both conditions manifestly unfavorable. In the remaining percentage of subjects the anatomic arrangements may be quite varied as to minute details, more particularly as to the opening in the papilla and the length of the diverticulum. For the ideal conditions of Opie's theory the two ducts must coalesce to form the diverticulum, and the length of the latter, the size of the stone, and of the opening into the intestine must be in just the right proportions for an impacted calculus to convert the common duct, the diverticulum and the pancreatic duct into practically a continuous canal, necessarily a very unusual combination of circumstances; but acute pancreatitis is so equally uncommon as to make the rarity of the preceding really supporting to the theory.

It is certainly true that several cases of the condition have been reported with small calculi in the diverticulum of Vater, and many others described as associated with cholelithiasis in which it is impossible to deny that a small stone so lodged may not have been overlooked or escaped into the intestine after having caused the trouble, or lost from one cause or another. The case which we have to report today had a gall-stone in the common duct; whether it may have slipped upward or whether

there may or may not have been another temporarily in the ampulla we cannot say, but as you will hear more at length later, the absence of bile stains in the duct of Wirsung, with the presence of bacteria, together with the character of associated lesions, lead us to believe that infection was the chief etiologic factor in this instance.

We well know that cholelithiasis is commonly associated with, if not usually the result of the presence of bacteria in the gall-bladder; experimentally acute pancreatitis has been produced by the injection into the pancreatic duct of suspensions of bacteria or their toxins, therefore it would seem highly probable that cholelithiasis acts in many instances as a predisposing cause independently of the manner suggested by Opie, and in some cases may also supply the exciting cause in the way of pathogenic microorganisms as well.

The etiology, I repeat, cannot be regarded as completely cleared up. Cholelithiasis is frequently, though not constantly associated with acute hemorrhagic pancreatitis; an impacted gall-stone in the diverticulum of Vater may and probably does act in some cases as claimed by Opie; infection doubtless fully accounts for others, with or without cholelithiasis, in the latter instances the duodenal catarrh, so evidently present from the clinical histories of a great many cases, may readily provide the source of the bacteria. Traumatism also would seem to be active largely in the production of a few cases according to some reported instances.

Other etiologic factors are alcoholism, syphilis, arteriosclerosis and chronic gastric catarrh; males are the more frequently affected in spite of the fact that women are so much more commonly the victims of cholelithiasis.

Symptoms: The symptoms of acute hemorrhagic pancreatitis may be almost typically illustrated by the case we have to report:

The patient, W. S. A., male, aged 50 years, was an inmate of the Columbus State Hospital for the Insane, and it is to the courtesy of the superintendent of the same, Dr Stockton, that I am indebted for the opportunity of working up and reporting

the clinical facts of the case. The man was admitted to the Hospital in March, 1894, suffering from chronic mania, and hence by reason of his mental condition his history is not as complete as we could wish.

He was of foreign birth, so his antecedent family history is entirely unknown; he was an unskilled laborer of irregular habits and exposed to the usual privations and vicissitudes of that class. He was a confirmed alcoholic.

Several times during his stay in the Hospital the patient had typical attacks of biliary colic, and for some time preceding his last illness he had a severe subacute gastroenteritis. Early on the morning of December 12, 1902, he was seized with severe colicky pains in the abdomen which appeared to the attending physician to be of the same character as those previously diagnosed as from an impacted gall-stone, but of rather more severity. A hypodermic injection of morphin was administered with but little relief, and a second was given in an hour or so. He still continued to be very restless, the pain apparently becoming constant, and he vomited repeatedly; the vomitus presented nothing unusual. The persistence of the symptoms and their change in character indicated that this illness differed from his former attacks, and an acute intestinal obstruction was suspected. I was called in to see the patient about six hours after the onset. The man then was distinctly in a state of collapse; his pulse, hardly palpable at the wrist, approximated 140; his extremities were cold, his face cold and clammy, and his expression was anxious; he was restless and talkative, and complained constantly; decubitus dorsal, with right thigh flexed on abdomen; the abdomen was not especially distended but markedly tender over epigastrium.

His raving led me to suspect traumatism somewhat, but there were no marks of injury and no history of such could be obtained. I disagreed with the diagnosis suggested owing to the suddenness and severity of the onset, but never having seen a case of hemorrhagic pancreatitis I failed to recognize the true condition. I inclined to the belief that the man had fallen or otherwise injured himself, causing severe obscure internal injuries, and therefore advised the usual stimulant treatment in order to allow of an exploratory operation if he should react. I had, however, no hope of the latter and was not surprised to hear of his death about 10 hours later.

The autopsy was performed 10 hours after death, at which time the following notes were made: The body is that of a large, muscular, well-nourished man. The subcutaneous fat is large in amount. Rigor mortis is present throughout, and algor mortis in the extremities only. The abdomen is markedly distended and tympanitic. There is a hydrocele on the right side. Old scars surrounded by large copper colored areas are on the extensor surfaces of both legs. Thick, greenish, sour-smelling fluid is coming from nose and mouth.

The brain weighs 1340 grams, the scalp bleeds freely, is thick and adherent. The calvarium is thin and firmly adherent to the thickened dura. The pia-arachnoid is thickened but not adherent to the convolutions. The blood-vessels are thickened and tortuous with wide lumena.

There is about 20 cc. of dark reddish fluid in the pericardial sac. The epicardial fat is edematous and increased in amount. In the left pleural cavity is about 500 cc. and in the right 120 cc. of fluid, similar in appearance to that in the pericardial sac.

On opening the peritoneal cavity quite a large amount of rather offensive smelling gas escapes. The abdominal cavity contains about two liters of reddish-brown fluid. There are no blood clots or shreds of fibrin. The intestines are distended, the walls thickened and of a purplish-red color. The mesenteric, epiploic and omental fat is markedly thickened and edematous, and thickly studded on its surface and through its substance with opaque yellowish areas. These areas range in size from two to five mm. in diameter, and by coalescing large areas are formed which are from two to three cm. in diameter. On section they are soft and crumbly. Numerous dark, hemorrhagic areas are scattered through the fat. The blood-vessels are distended with dark red blood. Easily removed adhesions surround the cecum. The appendix appears normal. The root of the mesentery, omentum, transverse colon, duodenum, spleen and pancreas forms an edematous adherent mass occupying the upper part of the abdomen. The adhesions are easily separated.

The pancreas is about three times its normal size, and is of a dark purplish-red color. Around the outer portion of the head

and through the parenchyma are a few areas of a light grayish color where the pancreatic lobules can be distinguished. There are numerous opaque grayish yellow areas in the edematous interlobular tissue. The pancreatic duct is not dilated nor bile stained. The splenic vein contains a large mixed clot of blood which extends nearly throughout its length.

The gall-bladder is small. It contains 135 faceted calculi and about 15 cc. of thick yellowish bile. The calculi range in size from two to six mm. in diameter. At the junction of the cystic with the hepatic duct is lodged a stone four mm. in diameter, which only partially occludes the lumen. The common bile-duct passes through the upper part of the head of the pancreas. The common, cystic and hepatic ducts are not distended.

The walls of the intestines throughout are thickened, the blood-vessels distended with blood and the mucosa markedly congested. In the cecum the mucosa is eroded in large areas. The intestines both large and small contain thin bile-stained feces. The stomach contained about 30 cc. of thick greenish, sour-smelling fluid. Its mucosa is thickened and intensely congested.

The liver weighs 1500 grams and through Glisson's capsule can be seen dark sharply defined areas. The areas are fairly numerous through the parenchyma and appear to be in relation with the branches of the portal vein whose lumina in places are occluded with blood clots. These are probably emboli from the thrombus in the splenic vein. The spleen weighs 100 grams, the consistence is very soft, the follicles not distinguishable in the congested and swollen pulp.

The left kidney weighs 150 grams, the right 170 grams. The fatty capsule is increased in amount, very edematous and thickly studded with yellow opaque areas and dark hemorrhagic areas. The fibrous capsule is easily removed, leaving a smooth surface. The cortex is of normal width. The cut surface is a bright pinkish color with yellowish areas through cortex and Bertini's columns. The pelvic fat is increased in amount and edematous. Both kidneys are alike.

There is a general condition of arteriosclerosis. The aorta is markedly atheromatous with areas of calcification. The areas of fat necrosis are limited to the abdominal fat.

Anatomic Diagnosis: Acute hemorrhagic pancreatitis, peritonitis, cholelithiasis, disseminated abdominal fat necrosis, gastroenteritis, arteriosclerosis, hepatic emboli, thrombosis of splenic vein, congested kidneys and spleen, chronic pachymeningitis and leptomeningitis.

Microscopic Examination: Pancreas. The parenchymatous and interstitial tissue is very necrotic in the majority of the sections examined. The nuclei do not stain, and the structure is very poorly defined. Areas of small round cells can be seen near the blood-vessels and through the interlobular connective tissue, which is markedly edematous.

A section from the head of the pancreas, passing through the common bile duct and the duct of Wirsung just before they emerge from the pancreas, shows large hemorrhagic areas with the red blood-corpuscles well preserved in the connective tissue around the ducts and between the lobules. The pancreatic cells in the section are in a state of necrobiosis and those surrounding the bile duct are in a more advanced stage than those surrounding Wirsung's duct. The inner surface of the common bile duct is bile stained, but the duct of Wirsung shows no pigmentation. A yellowish-brown granular pigment, which does not give the Prussian blue reaction for iron and is not soluble in chloroform, is quite abundant in the hemorrhagic areas, and is limited to these areas except in the necrotic portions where it is general throughout the tissue. This pigment is not in the cells. It is probably hemosiderin which has lost its reducing properties. There are small areas in which the pancreatic cells are almost normal and the areas of Langerhans appear quite normal. There is no pigment in these areas. The amount of pigment is in direct proportion to the amount of necrosis and hemorrhage.

In the sections of fat large areas are seen taking diffuse blue with hematoxylin stain. There are no nuclei seen nor can the outline of the cells be distinguished. These are areas of fat necrosis. In the pancreas the areas of fat necrosis are a dark

yellowish-brown with a border of brown needle-shaped crystals. Through the fat areas of small round cells are quite numerous and the blood-vessels are distended with red blood-globules. There is an extensive small round cell infiltration throughout the mucosa of the intestines with necrosis of its outer surface.

The liver shows a moderate amount of fatty infiltration with faintly stained nuclei in the parenchymatous cells. There is a desquamation of the endothelial lining of some of the branches of the portal vein which with red blood-cells and polynuclear leukocytes. occlude the lumina of these vessels. In the embolic areas in the liver the liver cells are necrotic and there is a large amount of dark brown granular pigment free in the tissue; this does not give the Prussian blue reaction. The blood-vessels also contain this pigment. There are many poorly-defined red blood-globules in these areas. The Malphigian follicles of the spleen show quite extensive amyloid and hyaline degeneration.

Throughout the body the blood-vessels are distended with blood, and small hemorrhages into the tissues are numerous. Gram's stain reveals many staphylococci and a few streptococci in the pancreas, staphylococci in the intestines, liver, mesenteric fat and thrombus of the splenic vein. No germs are found in the lungs, heart, spleen, or kidneys.

It is possible that a calculus had been present in the diverticulum of Vater and had lodged there in such a way as to cause the bile to pass into the duct of Wirsung and was later ejected into the intestines and lost. If so the bile by its presence may have caused, as Opie has clearly demonstrated that it can, an acute hemorrhagic pancreatitis. We are, however, inclined toward the belief that this is a case in which an infection extended from the intestines. We base this belief on the following findings;—a severe gastroenteritis, the absence of even a moderately distended gall-bladder and ducts, the absence of any appearance of bile in the duct of Wirsung and its branches, and the presence of cocci in the intestines, pancreas, and liver. The same conditions which cause a chronic appendicitis to suddenly light up with terrific force and rapidly fatal results may exist in such a case as this.

The very widely distributed and extensive fat necrosis, the edematous condition of not only the abdominal fat, but also the epicardial fat, the engorged blood-vessels throughout the body, the effusion of a sanguinous fluid in the pleural, pericardial and peritoneal cavities indicate the presence of an agent which is acting throughout the body. That this agent acts upon the walls of the blood-vessels, affecting their permeability, is very probable, although microscopically no changes in the walls could be distinguished as in Warthin's case.

The streptococcus and staphylococcus infection associated with the pancreatic secretion may produce an especially virulent and destructive agent.

Diagnosis: The recognition of acute hemorrhagic pancreatitis is difficult largely because, having been impressed with the idea of its extreme rarity, one is not on the lookout for it. In a suspected case the history of alcoholism, syphilis, arteriosclerosis, gastroenteritis, cholelithiasis, or traumatism may usually be obtained. The suddenness and severity of the onset, the location of the pain and tenderness, the presence of a rather ill-defined deep-seated tumor in the epigastric region, often persistent vomiting, and the marked state of collapse, out of proportion to any demonstrable lesion, present a symptom complex that once seen may hardly be forgotten or mistaken for anything else.

If death does not occur in the first 24 hours or so, peritonitis may promptly ensue, or in the course of days or weeks the signs of local suppuration or gangrene may appear.

Probably acute pancreatitis is most commonly mistaken for acute intestinal obstruction from one cause or another; the history of the case, however, with the suddenness of the onset and early development of shock, together with the fact that the constipation though present in both is not absolute in the pancreatitis, nor is the vomiting stercoraceous, should make a distinct differentiation if the case is seen sufficiently early. Later without an unusually clear history, after peritonitis has manifested itself, the diagnosis cannot be made with any certainty. In these obscure cases and in the secondary conditions of suppuration or gangrene the urine test of Cammidge may prove of considerable assistance;

this test has already received the support of Mayo Robson, but further observation and verification are needed before its full value may be stated.

Treatment: The first treatment indicated if the patient is seen early is self-evident, *i. e.,* to bring about reaction if possible. Occasionally pigmented areas have been found in the pancreas at autopsy in subjects dead from other diseases, which would seem to indicate the sites of former hemorrhages with possibly some localized pancreatitis and spontaneous recovery, although the positive significance of these findings cannot as yet be stated with certainty. Ordinarily there is unfortunately but little hope for the victim of a general acute pancreatitis, and as far as the primary state is concerned Cayley summed up the matter in 1896 when he said that the greatest practical importance in making a diagnosis of the condition lies in the consequent recognition that nothing further may be done for the patient, and hence the latter be saved from useless operation. If he survives the shock, however, the peritonitis, local abscess, or gangrene which almost certainly ensue require active surgical treatment *pro re nata.* In the necrotic condition, the case of Chiari, in which a portion of a gangrenous pancreas sloughed into the intestine, cannot be cited as an argument for palliative treatment. Thayer reports the first case diagnosed as the above and successfully operated upon, and there have since been many others of a similar nature, among them one, a member of our profession, recently presented by the operator, Dr J. F. Baldwin, before the Columbus Academy of Medicine.

BIBLIOGRAPHY

1. *Archiv für experimentelle Pathologie und Pharmakologie*, 1893, xxxi, p. 85.
2. *Medical Record*, v. 35, No. 8.
3. *Phila. Med. Journal*, Nov. 19, 1898.
4. *Lancet*, March 19, 1904.
5. Diseases of the Pancreas, E. L. Opie, 1903.
6. Contributions to Science of Medicine, 1900.
7. Archiv Bohem, 1890, iv, 189. (Quoted by Opie.)
8. Le diabete pancreatique. Thesis, Paris, 1892. (Quoted by Opie.)
9. Traité des malades du foie et du pancreas. Paris, 1899. (Quoted by Opie.)
10. *British Medical Journal*, July 4, 1896.
11. *American Journal of the Medical Sciences*, Oct. 1895.
12. *Wiener med. Woch.*, 1880, xxx, 189.

DISCUSSION

Dr A. F. House, Cleveland: The papers of Drs Gillette and Upham are certainly of a great deal of interest. It is only within the last few years that the pancreas has received the attention which its great importance occupies in the welfare of the human body. Surgical operation upon the pancreas is in direct relation with all the questions which relate to the functions of the organ. Emaciation, presence of fat in the stools, sugar in the urine, a bronze hue of the skin, jaundice, and pains are most important symptoms involving disease of the pancreas. That there is a direct relation in many instances between the disease of the pancreas and cholelithiasis, I think there can be no question. When we take into consideration that the common bile duct and the main duct of the pancreas unite in the diverticulum of Vater before reaching the lumen of the duodenum, it appears quite natural that a change in one may produce a pathologic condition of the other. That there is a direct relation, I am fully satisfied. Three years and a half ago I had a case which demonstrated most conclusively this relation. The history of the case is as follows:

Mrs S., aged 41, married, mother of four children, had always enjoyed good health up to within six weeks before operation, save on two occasions when she had had attacks of pain which her physician thought to be gall-stone colic. I saw her in consultation a few days previous to the operation, and she had then been in bed off and on for six weeks. At that time her temperature ranged from 100° to 103°. She was in constant pain, had occasional chills, and loss of appetite, accompanied by vomiting and extreme tenderness with rigidity of the muscles in the right hypochondriac and epigastric regions. On the evening before the operation, which occurred in February, 1901, she had a temperature of 104° and a pulse of 120, was severely jaundiced, and suffered great pain and occasional vomiting. An incision was made at the outer border of the right rectus muscle, and the peritoneal cavity was opened. No gall-bladder was visible; nothing but a mass of adhesions could be seen. The omentum, intestine, liver and stomach all seemed to be one mass. After separating the liver from its contiguous organs, which took considerable time, a diligent search failed to locate a gall-bladder. In the fossa, to the right of the longitudinal fissure in which lies the gall-bladder, a mass

of fibrous-looking tissue could be seen and felt, but there was no vestige of a gall-bladder. On passing the finger through the foramen of Winslow down along the common duct to the head of the pancreas, where it passes through, a small mass was felt, not in the duct, but in the head of the pancreas. On palpitating this mass with the finger it was hard and seemed indurated. This I immediately decided to be a malignant growth of the pancreas. The peritoneal cavity was thoroughly irrigated with normal saline solution, a gauze drain was introduced, and the wound was closed up to the drainage tube. That evening her temperature dropped to 102°, and her pulse to 100, and to my surprise she made an uninterrupted recovery. She has not had any pain or trouble since. This case, I am fully satisfied, was one in which a benign transitory swelling of the pancreas caused sufficient pressure to obstruct the common duct and clinically gave a typical history of gall-stone colic.

Dr Horace J. Whitacre, Cincinnati: Dr Upham's paper is certainly a very interesting one, and I would agree with him in his explanation of the case as due to infection. I would like to report in this connection some recent experience which seems to bear out the gall-stone theory of pancreatitis.

In the first place I have repeated the experiments of Dr Opie, and have produced hemorrhagic pancreatitis and fat necrosis by injecting bile into the pancreatic duct.

Very recently, while in New York with Dr Wood, I attended an autopsy in a case of acute hemorrhagic pancreatitis, which was an exact counterpart of the cases reported by Opie. A number of gall-stones were found in the gall-bladder and there was a small stone lodged in the apex of the diverticulum of Vater in a manner which could be accurately represented by the drawing which Dr Upham has placed on the board. This pancreas showed the most perfect type of acute hemorrhagic pancreatitis. The duct of Wirsung was dissected up, and was found to be bile-stained throughout. My experiments, when taken in conjunction with this clinical case, certainly lead me to believe that cholelithiasis with lodgment of a stone in the diverticulum and regurgitation of bile into the duct of Wirsung is a definite cause of acute hemorrhagic pancreatitis; yet, as Dr Upham has already stated, I do not believe that it is the sole cause.

Dr J. H. J. Upham, Columbus, in closing: I merely wish to repeat the fact that I do not question at all that Dr Opie's theory may account for a number of the cases of acute hemorrhagic pancreatitis, but I believe also that some cases may be caused by other conditions, and particularly by infection from the intestinal tract, of which the instance I have reported is an example.

Cocain Anesthesia in General Surgery

By W. J. Means, M. D., Columbus

The possibilities of cocain anesthesia in general surgery are not appreciated by the profession in general. While the last decade has witnessed wonderful strides in the use of this agent and in the technic of its application, both in general and special surgery, the limit has not been reached. This great progress has been due largely to an improved technic and a fuller knowledge of the physiologic properties of the drug.

The analgesic properties of cocain were discovered by Koller in 1884. It is an alkaloid of coca erythroxylin and is used in the form of a hydrochlorate. It has a strong competitor in eucain, a synthetic proprietary agent that is made under a secret formula. It is claimed for eucain that it is less toxic than cocain, equally as powerful in its analgesic properties, forms a more stable mixture and can be repeatedly boiled without destroying its physiologic properties.

On the other hand some authorities, such as Cushing, claim that the action of eucain is tardy in appearing and more fleeting than cocain; also that sloughing of the tissues has followed its use. Its maximum dose is from six to seven and a half grains, while that of cocain is one to one and a third.

The disadvantage of less certain analgesia, greater irritation to the tissues and liability to produce necrosis are sufficient in my judgment to give it a secondary place to cocain.

Cocain hydrochlorate is very soluble in water and makes a neutral solution. The solution deteriorates very quickly, becoming flocculent and acid. Just in proportion as the solution acidulates it loses its analgesic properties and becomes an irritant. The acidity may be corrected by the addition of a slightly alkaline solution made with bicarbonate of soda, but the sediment can only be removed by filtration. A deteriorated solution is not fit for hypodermic use unless boiled and filtered.

Cocain is used endermically and hypodermically. It has no effect on the sound skin but acts quickly and profoundly on mucous membrane, on granulations and in places in which the epidermis has been removed. Endermic medication requires a much stronger solution (2 to 10%) than hypodermic. Cocain is a powerful cerebral, cardiac, respiratory and nervous stimulant and under some conditions a prompt diuretic.

In lethal doses it paralyzes the intramotor ganglia, the posterior columns of the cord, sensory nerves and respiratory centers. The symptoms that are likely to develop following its administration are tingling and numbness, difficulty in swallowing, frequent and irregular heart action, syncope and spasm. Its action varies in different persons. This is so marked that it should never be administered carelessly and without due preparation to antidote any untoward symptoms. No physician should think of administering a general anesthetic without carefully examining the patient and without the proper means of meeting an emergency. Cocain, while acting differently on the system, is perhaps equally as dangerous if used carelessly, but fortunately is much easier controled. I am inclined to believe that individual idiosyncrasy is not more marked than that noted in the use of morphin, atropin and some other powerful alkaloids. It has been my experience that individual susceptibility is confined largely to nervous persons, women especially, and that many of the nervous symptoms are psychal, due largely to fear and horror of an operation.

Children act badly under cocain when allowed to witness the operation. Relieved of fear they bear it quite as well as adults.

The antidotes are morphin, hypodermically, ether and nitrite of amyl by inhalation. As a preventive of systemic effects whiskey is an excellent agent given 20 to 30 minutes before administering cocain. The most reliable preventive and at the same time an aid to anesthesia is morphin. I make it a rule to give a hypodermic injection of one-fourth grain of morphin 15 to 20 minutes before beginning an operation of any considerable magnitude. In some cases it becomes necessary to give a general anesthetic before the operation is completed. It usually requires a very small amount of chloroform. This combination makes a triple anesthetic and produces what is known as morphin, cocain and chloroform anesthesia.

Reclus, who reports 7,000 operations under cocain anesthesia without a death, insists on the observance of the following rules:

"1st.—Never use a stronger solution than 5% externally and 1% hypodermically.

2nd.—Always have the patient recline during the administration of the anesthetic and not get up for half an hour after.

3rd.—Always have the patient eat and drink something before rising."

The writer has administered cocain over 3,000 times in the last 10 years without a serious complication. The following are some of the operations: Amputation of fingers, hands, toes, leg, removal of tumors, large and small, located in various parts of the body, variocele, hydrocele, phimosis, internal urethrotomy, hemorrhoids, tracheloraphy, ligation of arteries, skin grafting (Schleich's method), removing foreign bodies from the tissues and from the eye, operation on eyes, nose and throat, herniotomy, thyroidectomy and opening abscesses and boils.

The analgesic action of cocain lasts about 20 to 30 minutes, according to the vascularity of the parts. Its administration should be governed by the strictest attention to details of individual idiosyncrasy as before mentioned, to the medicament and its preparation, to the mode of administration and to the location and condition of area to be operated.

The Medicament: For convenience and accuracy the drug should be kept in tablet form of exact proportion. Tablets containing one and an eighth and two and a quarter grains of cocain are the most convenient. The former is most economic. They should be purchased from some reliable pharmaceutic house that will guarantee the purity of the drug. It is claimed by some observers that the accidents following cocain administration are largely due to impurities. The expensiveness of cocain is an inducement to unscrupulous manufacturers for adulteration. The price, therefore, should be a secondary consideration.

It is a well-established rule that none other than fresh solutions should be used. Failure to follow this rule has led to many unpleasant and disastrous results and accounts for much of the prejudice against cocain anesthesia. Dentists are prone to use stock solutions for pulling teeth, the result of which is manifested in the frequent occurrence of gingival abscesses and periosteal inflammation from infection.

The tablet should be dissolved in boiling water and the solution then placed in a water bath and kept as near the boiling point as possible for several minutes. Matas has demonstrated that a cocain solution can be boiled without destroying its physiologic properties. My experience has been the same. The solution should be free from sediment and used at a temperature of about 100°. A warm solution is distributed much quicker in the tissues than a cold one.

Strength of Solution: I am convinced from repeated experiments that under most conditions the milder solutions are not only safer but will produce analgesia quicker, more profound and cover a wider area than the stronger ones.

An exception might be noted in inflammatory conditions in which the tissues are indurated from exudates. There is, however, a limitation to the efficiency of attenuated solutions. I have found that in some cases strong solutions are necessary. The formula that I have found most useful in general practice is:

Cocain hydrochlorate .....gr. 1⅛
Sodium chlorid .....gr. 4
Boiling water .....one ounce.

This makes a one-fourth of 1% solution. This strength has served me so well that I seldom change it either for minor or major work. I am not an advocate of Schleich's infiltration method nor of his formula. My chief objection to infiltration is edema of the parts, which changes somewhat the anatomic arrangement of the tissues, interferes with the manipulation of the parts, interferes with repair and modifies anesthesia of sensitive areas. I think it has been proved beyond a doubt that satisfactory operative anesthesia cannot be produced by infiltrating the tissues with a cold salt solution according to Liebreich's method. I grant that an intradermic injection of cold water producing what is known as *anesthesia dolorosa* is practicable in some cases and in tissues not highly sensitive, but in my experience has not been satisfactory in general work. The presence of cocain is necessary to a complete analgesia of the peripheral nerves. I have not been able to determine that morphin added to the solution increases the effect of the cocain or prevents its lethal action. For some time I have been using adrenalin as an adjuvant and have been well pleased with its action. In operations of any consequence I add sufficient adrenalin to make a 1-20,000 solution, taking the commercial solution of Parke, Davis & Co. 1-1000 as the unit. I am satisfied it aids the analgesic effect of the cocain, antidotes its lethal action and controls capillary hemorrhage. I usually add 25 minims to an ounce solution.

Conceding, therefore, that cocain is the active agent it should be the purpose of the operator to use the least amount

consistent with satisfactory anesthesia and I might add with a minimum amount of fluid.

The conditions of the parts to be operated should receive careful attention. Inflammation forms no barrier, but the exudates impede the distribution of the fluid, thus limiting the area of anesthesia. Injection of inflamed tissue also produces considerable pain. This is increased in proportion to the amount of fluid injected. It is, therefore, the best to use a stronger solution and inject a less amount. It may be necessary to anesthetize the desired area to make the punctures much closer than in normal tissue. If there is pus present care should be exercised to prevent the needle from coming in contact with it until all the punctures are made. The reason for this is obvious. Location and vascularity are other factors that must be considered. There is greater liability to toxic effect attending operations about the neck and face, owing to the vascularity, than in other portions of the body. The anesthesia is also more evanescent. In minor operations it is seldom necessary to use more than one to two drams of the solution. In the extremities anesthesia can be prolonged by constricting the circulation. As a safeguard against toxic effects this, however, is unnecessary.

The Technic of Administration: The syringe should be entirely of metal so that it can be thoroughly sterilized. Personally I prefer Detmar's syringe which is composed of three pieces, barrel, piston and needle. A syringe with washers of rubber or leather, screw caps and needles is not reliable.

The field for operation, whether for minor or major work, should be prepared with the utmost care. Unsatisfactory results, such as infection, imperfect union and chronic irritability of the parts, met with by a great many operators, I am satisfied are due to a faulty technic. There are various methods suggested for placing the fluid. The first insertion of the needle should be the only painful one and even this can be minimized by touching the skin with

pure carbolic acid. Once the needle is inserted the fluid should be slowly forced into the tissues, the needle being introduced further and further as the parts are anesthetized. The needle should then be drawn until the point is at the opening and reinserted in another direction. A large area can thus be anesthetized with one puncture. If a single incision is all that is desired, the fluid may be inserted along the line by withdrawing the needle and reinserting it in the anesthetized area. If the deeper tissues are to be incised it is necessary to reinject them after the skin has been opened.

Halstead has demonstrated that complete anesthesia depends much upon introducing the fluid in close proximity to the nerves supplying the area being operated, therefore, by a close study of the anatomic distribution of peripheral nerves has enabled him to anesthetize parts and perform operations without pain that formerly were very painful to the patient. This brings us to the question of cocainizing the nerves by intraneural injection.

Crile and Cushing advocate the former method. They inject the nerve trunk as a preliminary step to an amputation; for example, if an operation is to be made on the leg, the anterior crural and sciatic nerves are exposed and injected. This completely blocks all afferent impulses and produces what Crile terms a physiologic amputation.

Permanent injury to the nerves has been reported by some operators after intraneural injections. I am inclined to believe from a limited experience that this is a valuable procedure in amputation as a preventive of shock even when a general anesthetic is used. I have found that paraneural injections are quite sufficient in most cases in general work.

I have purposely avoided any discussion of spinal cocainization. It is not a practicable procedure for the general practitioner and, therefore, does not come within the scope of my paper.

Advantages of Cocain Anesthesia: 1. Avoidance of postoperative sequelæ, such as shock, vomiting, urinary

trouble and general comfort of patient. 2. Its comparative safety over general anesthesia, minor operations and in cases of shock. 3. As a time saver to the patient in minor operations. 4. As a convenience to the physician when no assistant is at hand.

Disadvantages: 1. Some pain to the patient during the operation. 2. Operation more difficult on account of distraction of surgeon's mind to feelings of patient. Cocain will never supplant general anesthesia, but when its possibilities are appreciated it will be employed much more extensively than at present.

BIBLIOGRAPHY

Gibbon—*Philadelphia Medical Journal*, May 2, 1903.
Lea—*Lancet*, March 29, 1902.
Barker—*Lancet*, July 25, 1903.
Crile—
Griffith—*American Medical Journal*, March 7, 1903.
Cushing—*Annals of Surgery*, September, 1902.

DISCUSSION

Dr J. G. Spenzer, Cleveland: I wish to make just a historic correction of Dr Means' paper. The Doctor has stated what is generally supposed to be true, that is, that Koch discovered the local anesthetizing action of cocain. Koch rediscovered it in 1886. Demarle in 1862, Moreno y Maiz in 1868 and Torsellini in 1885, proved the local anesthetizing action of the drug. They applied it both by dusting it on the nerve trunk and penciling the nerve, as well as by subcutaneous injection. It is a well-known fact that the cocoa chewers (coqueros) of the Andes noticed the local and systemic paralyzing effect when they chewed the leaves.

Dr Wm. E. Lower, Cleveland: I wish to say just a few words relative to the use of cocain as a local anesthetic, especially as regards its use in major operations. It has been my pleasure to have been associated with Dr Crile in this line of work, and I can say that we have been able to perform extensive operations in cases in which a general anesthetic could not be given. For example, amputations at the shoulder joint, amputations of the leg, laparotomies, hernias, etc. As to the strength of solution, we use a much

smaller strength than the essayist, one-tenth of 1%. This has been found sufficiently strong to cocainize the skin. One of the important indications for the use of cocain is to prevent shock. As is well known, a general anesthetic does not prevent afferent impulses along nerve-trunks, but this can be prevented by cocainizing the nerve-trunk before severing it, and this we always do in amputations in which the large nerve-trunks can be exposed. As to the relative merits of eucain and cocain in work on the urethra, I want to say that while formerly I used eucain, I have now returned to cocain, 2% solution. I find that eucain is very irritating to most mucous membranes.

Dr M. Coplin, Cleveland: I want to state that I have had very successful results with cocain anesthesia. A few months ago I operated under cocain anesthesia on a case of empyema in a man 54 years of age. Any other anesthetic was out of the question in this case. The results were most gratifying. The cavity closed up in about five weeks after the operation, and the man is now working every day.

Dr Herrick, Cleveland: I want to ask the author a question in regard to the use of adrenalin as an injection. I understand adrenalin injected under the skin is liable to cause local sloughing and gangrene. We have used salt solution in those cases.

Dr Horace J. Whitacre, Cincinnati: I wish to commend highly Dr Means' valuable paper, which, I believe, has brought this subject before us in a very comprehensive manner. It is certainly true that cocain anesthesia can be used in a wide variety of cases. I have used it with perfect satisfaction in almost every operation mentioned by Dr Means, and in addition have used it with great satisfaction in operating by the McBurney operation for abscess cases of appendicitis, in operations in the region of the gall-bladder, in colostomy and in amputations. An extremely valuable point has been brought out by Dr Lower, in his discussion of this paper, namely, the prevention of shock by nerve blocking. Dr Crile has positively demonstrated that the blocking of a nerve-trunk prevents the shock of operation as well as the pain and I have taken advantage of this point in railroad surgery. Before beginning any operation in these cases, even that of trimming up, I regularly expose the main nerves and inject a 2% solution of cocain into the trunk and

am certain that I have in this way prevented any additional shock in these patients who are already suffering so severely from this condition. I have, furthermore, used cocain with considerable satisfaction in sewing up lacerated wounds in various parts of the body. The suture of an extensive scalp wound is rather a painful procedure, yet is one which does not justify a general anesthetic. In these cases, I have used a very fine hypodermic needle to inject cocain along the edges of the wound in the region which is to be punctured by the needle in suturing. If the hypodermic needle is introduced at one end of the wound and the cocain injected as the needle advances both edges of the wound can be completely anesthetized and the patient will feel only the first prick of the needle and will not feel any pain in suturing. I have found some difficulty in anesthetizing loose tissue. I recently attempted to remove a breast under Schleich's cocain anesthesia for a benign tumor. This patient knew something about cocain anesthesia, and, in fact, almost demanded that I use this method. Owing to the fact that the tissues are so loose in the region of the breast, I failed to get a satisfactory anesthesia. I completed the operation with this anesthetic, but not without considerable pain to the patient. In my cocain anesthesia work I almost uniformly use Schleich's solutions, Nos. 2 and 3.

Dr E. E. Brown, Cleveland: I have enjoyed this paper of Dr Means very much, and don't want to criticise; but I want to suggest a few parallels in some of these cases. Cocain anesthesia, of course, holds the field of local work, but when you come to considering it for a general anesthetic because you cannot give the ordinary general anesthetics, I want to suggest nitrous oxid. The advantage of the gas has everything that cocain holds, unless it be the fact that the gas requires a bunglesome apparatus, and that the cocain can sometimes be given without an assistant. In working with Dr Scott and other surgeons in the city, I have given nitrous oxide in almost all classes of cases when they cannot take a general anesthetic, and have yet to find a bad result from its use. The dangers I guess, as far as infections are concerned, would figure up less than cocain. One in five millions and a quarter is the percent.

Dr Park L. Meyers, Toledo: I would like to add my commendations to the paper Dr Means has given us. In regard to the prevention of shock by the use of cocain, I

think that there has been an exaggeration of the great influence of cocain, in regard to the prevention of so-called shock through the advantages of one anesthetic over another. When Dr Means tells us that he assures his patients of having no pain, I think he strikes the right path to avoid the bad results we get, even from general anesthesia. I think if we were to prepare the way the dangers which we have would be lessened. Surely one of the many things in favor of cocain is that you overcome that fear which people have of taking a general anesthetic. That relieves them.

There is but one thing more. Dr Means spoke of administering adrenalin, but he did not tell us whether he recognized the fact that the adrenalin as prepared by the Parke, Davis & Company contained a certain amount of chlorotone, consequently you have two anesthetics. And again, in the skin grafting, the Doctor did not tell us on which person he used the cocain. The one he took the skin from or the one he put it on to. I have found in cases in general in which I have used cocain that it was followed by a death of the skin, or sloughing, probably due to uncleanliness. I did think it was due to some effect on the nerve-trunks, supposing I had used it too strong. Such could be possible, when the Doctor states he uses only one-quarter percent, and then Dr Lower says he uses but one-tenth percent and he finds that will do the business and he can do operations. I do think that when we find what a good effect we have on our patients by talking to them, this should be followed out.

I have always used constriction. The older teachers taught us that we should use constriction and a very small amount of the drug can be used; but Dr Means tells us with his one-quarter percent solution he does not use constriction. I would ask if he has in every instance abolished constriction.

Dr W. J. Means, Columbus, in closing discussion: I wish to say relative to adrenalin as an adjuvant to cocain that my experience with it has not been sufficiently extended to definitely determine the advantages and disadvantages. As stated in my paper I have administered it in about 50 cases without any bad results. One of the most noted and constant effects is controlling capillary hemorrhage, making it possible to perform small operations without being bothered with excessive bleeding.

I believe that intraneural injection of cocain should be practised in amputations. It unquestionably controls shock. This method is especially useful in emergency amputations following injuries. Analgesia of the nerve-trunks prevents additional shock.

Constriction of the circulation is not necessary to prevent lethal effects as long as the milder solutions are used. It will assist, however, in prolonging analgesia and controlling hemorrhage.

I wish to emphasize the necessity of a perfect technic in the use of cocain. Without this accidents are common. The disfavor in which cocain anesthesia is held is largely due to faulty technic, impure drug and the use of too strong solutions.

The Relation Between Typhoid Fever and Appendicitis

By N. Stone Scott, M. D., Cleveland

Few diseases require a wise physician's skill more frequently than typhoid fever; few demand more speedy assistance at the surgeon's hand than appendicitis. The diagnosis of each is comparatively easy when the patient begins with the classic symptoms. General malaise, headache, a temperature higher at evening than in the morning and gradually rising each day, tympanitis and diarrhea, indicate typhoid; when these symptoms are supplemented by an increase of splenic and liver dulness, petechia, and Widal reaction, the diagnosis is certain. On the other hand, severe pain in the abdomen beginning suddenly, first general, then localized in the right side, one or two attacks of nausea, rigidity of the abdominal muscles, steadily increasing temperature and pulse-rate, and a high leukocytosis, are proof positive of an acute appendicitis.

In arriving at a diagnosis typhoid fever is rarely confounded with chronic appendicitis although they may be coexistent. The same, however, cannot be said of typical cases of acute appendicitis and typhoid fever. Certain

characteristic symptoms may be absent altogether, while some of minor importance seem unduly prominent, or those usually belonging to other pathologic conditions may be noted. It is under such circumstances that typhoid fever in the early stages simulates appendicitis and other inflammatory diseases, or after the illness has lasted a few days we find the severe sepsis of appendicitis mistaken for typhoid. These irregular cases, bringing in their train obscurity and complexity, are both frequent and weighty, requiring the keenest perceptions, and highest grade of skill; yet, notwithstanding all, the differentiation between atypical typhoid fever and appendicitis will sometimes baffle even the most experienced.

There is no one pathagnomonic symptom always present in either disease. Whether by their presence or their absence, some of the features are oftentimes misleading, and must be considered in the light of all the attending manifestations.

Pain, a foundation symptom of much importance in abdominal diseases, might be of even greater assistance in forming a correct diagnosis were there but some means for its accurate measurement. The pain of appendicitis begins suddenly, it is often the first sign of illness, at first general or more pronounced in the epigastric or umbilical region, in from 12 to 24 hours it becomes localized in the right side at the site of the appendix, which is usually at or near McBurney's point. This pain is constant and intense, but not of the excruciating character of the calculus pain. Its severity is frequently in direct ratio to the seriousness of the disease. In gangrenous appendicitis after a lapse of from 48 to 72 hours the pain is decidedly ameliorated; this is dangerous for the patient because the active symptom has subsided while the pathologic condition is progressing. In typhoid fever there is more complaint of general malaise, of headache or bones-ache, than of abdominal pain, the latter if present at all is apt to be evanescent and fleeting rather than constant or severe. Still cases of typhoid are not infre-

quently found, especially in children, which are marked by moderately severe pain; also exceptional cases of appendicitis are sometimes known in which there is evidence of little pain.

Temperature naturally follows pain in acute appendicitis, at first normal or even subnormal owing to shock, soon it rises steadily and constantly, rarely, however, higher than 103° Fahrenheit. Later it may ascend beyond that point with irregular remissions; this denotes septic absorption. A high temperature unaccompanied by prominent local disturbances is suspicious of typhoid, whose ordinary course is marked by morning remissions and evening exacerbations, with a temperature gradually ascending during the early part of the disease and descending during the latter part. Both typhoid and appendicitis are usually accompanied by elevation of temperature, still either disease may run its course with slight if any increase. In typhoid this nearly normal temperature bespeaks a mild course, but not necessarily so in appendicitis; if depression is extreme the appendicitis not infrequently terminates fatally. A sudden drop of temperature in the course of either disease denotes the advent of some abdominal complication.

Temperature and pulse naturally sustain a definite relationship one to the other. A rapid pulse with high temperature signifies severe infection; if there be but little pain, tenderness, or tumor, typhoid or some other disease not requiring surgical interference should be suspected. When, as not infrequently happens either at the onset or during the course of the disease, pulse and temperature differ, the pulse will be found the more reliable index. A quick pulse without temperature or local symptoms is of nervous origin or else denotes merely some unimportant ailment. A high pulse, without temperature, but with pain and shock, indicates severe hemorrhage, such as ruptured extrauterine pregnancy or some similar accident.

Abdominal rigidity indicates peritonitis in the neighborhood of the anterior abdominal wall, and is usually present

in acute appendicitis. When the history points to acute appendicitis but with a flaccid abdomen, either the history is misleading or the appendix is located where an attendant peritonitis cannot affect the abdominal muscles, namely, in the pelvis or high up under the liver. If in the latter position it is not infrequently mistaken for an acute cholocystitis or nephritis. Muscular rigidity is rarely present in typhoid except in children. If one never operates on a flaccid abdomen he will not operate in the initial stage of typhoid.

Most cases of typhoid, especially adult cases, are without local tenderness; even when present it is not well defined. To the surgeon abdominal tenderness is of the greatest assistance, not so much in making a diagnosis as in locating accurately the diseased organ. Yet to give this symptom its proper significance requires long practice and careful discrimination. The patient's fear of impending operation frequently prevents his showing signs of tenderness during examination, and may even cause prevarication concerning his condition. Points of referred pain must not be overlooked; frequently in appendicitis tenderness is noted in the stomach, or left side in the region of the sigmoid; on pressure these points may be sensitive, but not so sensitive as the appendix. Pressure on the left side of the abdomen causing pain on the right is of great importance, being quite suggestive of appendicitis.

The presence of a tumor in the right side is strongly indicative of appendicitis, but the history must correspond; even at the best it is sometimes difficult to differentiate between appendicitis and tubercular lymph adenitis in young people, or in middle-aged people between an appendicitis and an inflamed carcinoma. With typhoid there is no general peritonitis and rarely a well-defined tumor; at most the latter is merely an indistinct sense of deep resistance of illy-defined outline.

Examination of the blood is very important in all doubtful cases. The typhoid bacilli and Widal reaction can

rarely be found early, but when they do occur they are almost proof positive of typhoid. A high leukocyte count in the beginning is strongly indicative of appendicitis, as a marked leukocytosis is never present in typhoid, except in the rare cases of mixed infection in which there is beside the typhoid a marked septic infection. A normal leukocyte count, however, is sometimes most misleading; not infrequently in fulminating appendicitis the shock to the system is so great that there is no increase in the number of leukocytes. The condition of the stomach and bowels, kidneys, nervous system, heart and lungs, is of little differential diagnostic value. If there is enlargement of the liver and spleen, that is of assistance in establishing the diagnosis of typhoid. The development of the symptoms of acute appendicitis during the first week of typhoid is usually due to a typhoid infection of the appendix; if these symptoms occur during the latter part of typhoid, a typhoid perforation is indicated, the latter is not easily distinguished from gangrenous appendicitis; this is of the less importance as laparotomy is demanded in either case. If a typhoid appendix is suspected no operation should be undertaken unless the symptoms are so severe as to throw considerable doubt upon the diagnosis. If, however, there is probability of perforation the leaders of the profession are strongly in favor of early operation provided the condition of the patient warrants it. Should one find on opening the abdomen that the perforation has not already taken place he is to be congratulated, for a threatened perforation which gives rise to a local peritonitis soon becomes perforation, a most desperate condition, for rare indeed is the case in which an adhesive inflammation limits the spread of the infection which takes place on perforation.

The following illustrative cases have been selected at random:

Dr Greene was called to see an eight-year-old boy who was taken with sudden abdominal pain. He found him with flexion of the thigh, muscular rigidity on the right

side, somewhat bloated, and both temperature and pulse were high. His mother had noticed that he had not been well for two or three days. At the request of the family, a consultation was called for the next morning. We found his temperature unchanged, tenderness and muscular rigidity a little better, leukocytosis not marked, and a slight increase of liver and splenic dulness; our diagnosis was typhoid fever. It ran an ordinary course to recovery. This is not an uncommon picture of the manner in which typhoid simulates appendicitis.

It is, however, the mistake in the other direction that most frequently proves fatal. Many are the cases nominated typhoid, sometimes by the entire council, sometimes with but one or two dissenting voices, that are nearly beyond human aid, except by means of speedy appendectomy with drainage. The retrocolonic appendix is the one most likely to give rise to this lamentable mistake.

Only a short time ago I was called out of the city in consultation with a well-known physician who stated that his diagnosis at first had been typhoid fever; latterly, however, the symptoms had been such as to baffle him completely. We found the patient with a high temperature and pulse, bathed in profuse perspiration, with abdomen so distended as to obscure the deep retrocolonic abscess. On opening this abscess from the back, a gangrenous appendix which had sloughed off and a fecal concretion were washed out by the pus which had been under tension. Recovery was uninterrupted. It can readily be seen that the case was hopeless, without speedy operation; the patient would soon have died had the treatment for typhoid been continued.

Miss S. had chronic appendicitis for more than a year, but not of sufficient severity to prevent her continuing her duties as a nurse. She then developed a well-marked case of typhoid, with the usual symptoms, consisting of general malaise, headache, gradually increasing fever, enlargement of the liver and spleen, abdominal distention, and petechia. About the fourth day of her confinement in bed she was suddenly taken with intense abdominal pain, her pulse became much more rapid and feeble, she vomited once, and

developed right-sided muscular rigidity. I saw her two hours after the onset of these symptoms of appendicitis. Her features were drawn and pinched, she presented the appearance of an exceedingly critical case; there was no Widal reaction and but slight leukocytosis. Fearing a fulminating appendicitis or perforation, we removed the appendix, which was found to contain a small fecal concretion, and the evidences of chronic appendicitis in the distal extremity. The rest of the appendix was moderately congested, but was not gangrenous nor perforated, nor as severely inflamed as we had expected to find it. As soon as she became conscious after the anesthetic, she was relieved of the pain. Her typhoid ran a moderate course and was in no wise complicated by the operation although she was treated by tubbing. This case presented symptoms of fulminating appendicitis in the first week of typhoid due to a typhoid infection of the appendix.

Mr B. was referred to me by Dr Kerr. During the spring and summer of 1903 he had walking typhoid; the principal symptom was a persistent diarrhea; this resulted in severe chronic constipation. In the fall of the same year Dr Kerr was called, at which time he made a diagnosis of retrocolonic acute appendicitis. At the operation the appendix gave evidence of a recent severe inflammation; the ileocecal valve and adjacent ileum were deeply inflamed, the serosa had lost its glistening appearance, and all the tissues were greatly thickened, so much so as to seriously narrow the lumen of the intestine. The appendix was removed and an ileocecoplasty performed. An uneventful recovery ensued, and the patient was relieved of his constipation. The case proved to be typhoid with resultant partial obstruction of the ileum, this in turn complicated by an acute appendicitis.

Miss D., 22 years of age, was referred to me by Dr Gentsch. She had always been in good health until typhoid fever developed in the spring of 1899. This ran a more or less severe course with no apparent complications, but convalescence was not complete; it soon became manifest that her failure to recover was due directly to chronic appendicitis, of which there were no symptoms before her attack of typhoid. She was operated upon in September, 1899; as was expected, chronic appendicitis with hypertrophy and extensive adhesions was found. Following the operation

convalescence was thoroughly satisfactory. Typhoid was in this instance an etiologic factor in producing chronic appendicitis.

Miss C., referred by Drs Somerville and Hudson, had a typical attack of acute appendicitis, including a mass in the right side; after her convalescence was established and the temperature had been normal for a week, it began gradually to mount a little higher each night accompanied by headache. In a few days it had reached 103° Fahrenheit. At this time I was called in council and confirmed the Doctor's findings of a well-defined mass at McBurney's point, with some bloating and tenderness. There was no leukocytosis, no Widal reaction, nor increase of splenic dulness. On inquiry as to the bowels it seemed that they had been moved every day, but by enema only. It was decided first to induce thorough action of the bowels; this, however, proved to be rather difficult, requiring two days for its accomplishment. During this 48 hours, as the symptoms were not worse, we therefore decided to wait a little longer, and she soon developed other signs of typhoid fever. The after-history of this case, which began with acute appendicitis, was of a moderate course of typhoid, during which the periappendicular exudate was absorbed, but the patient was left with a chronic inflammation of the appendix. This organ was removed several months afterward with complete recovery as the result.

The foregoing cases, and many others of which these are but examples, place at our disposal a few fundamental facts.

Typhoid simulating appendicitis is less dangerous as to the patient's condition and far less likely to receive treatment proving fatal, than appendicitis masquerading in the garb of typhoid fever.

Acute appendicitis developing during typhoid should be treated much as if the typhoid did not exist, a mild case of course being carried to the interval if possible.

Perforation is, however, preferably treated by operation; the wound-healing process will be uninfluenced by the typhoid, except as the latter may have reduced the strength of the patient.

Appendicitis during or following a course of typhoid fever is not usually a mere coincidence; typhoid is an etiologic factor in inflammation of the appendix.

The differential diagnosis of the two diseases is often most difficult and some times impossible. An early council of physicians and surgeons is advisable in doubtful cases; and in the atypical it is exceedingly important to weigh carefully everything which can have the slightest bearing even to the most minute details. At the best, failure to make a diagnosis brings distress to the family and discredit to the physician; too often the patient pays the penalty.

DISCUSSION

Dr Wm. J. Gillette, Toledo: I was very much interested in this paper, because so frequently we see errors of diagnosis in this matter of appendicitis. Within a week or 10 days the following happened: I was called in consultation to see a patient who was supposed to be suffering from typhoid, but the gentleman who called me was unable to account for the severe pain. The man had only been sick two or three days. When I saw the patient, I diagnosed the case as one of appendicitis and suggested operation at once. The attending physician said it could not be appendicitis, that I must be mistaken, and I therefore went my way. Within a few hours a very old physician was called in, who agreed in the diagnosis of typhoid fever. Five days afterward I met the man who had called me at the depot, and asked him if it proved to be typhoid or appendicitis. He said it was typhoid, but they were burying the patient that day. It is quite true, of course, as the Doctor has said, that the appendicitis is frequently a secondary infection in typhoid. I would like to have it said, however, that appendicitis is often diagnosed by the general practitioner as typhoid fever.

Sacral Teratoma

By Lester Keller, M. D., Ironton

A teratoma may be described as being a tumor containing the remains of a fetus resulting from inclusion of one abortive fetus within another which develops normally, one variety being a dermoid cyst.

The sacral is the most common. It occurs but once in 35,000 labors, so that the majority of us are not supposed to see many cases. Dr Barton Cook Hurst, of Philadelphia, writes: "The tumor is almost invariably a rounded mass with cystic contents and indistinct indications of embryonic development. I know of no other case where there is the rudimentary development of limbs that yours shows. This condition of the limbs which yours shows comes under the classification of ectromelus."

The cystic tumor most commonly found is attached to either anterior or posterior surface of the sacrum and is covered with skin continuous with that of the body of the autosite. I can find in the literature at my command very few cases having rudimentary limbs.

A classic case was described by Ammon in which in the third year a congenital tumor opened, revealing a supernumerary leg which was amputated at seventeen; cases are reported, one by Preuss, and one by Ahlfield, in which there were movements in the parasite caused by muscular tissue within the sac surrounding it. In this connection I want to report a rare and interesting case.

During the month of November, 1903, Dr G. W. Chabot, of Otway, Ohio, referred a case to me for operation.

Lenora Yonkel, aged four and a half years, female, was fairly well developed and in good health. An examination revealed a sacral teratoma extending about five and a half inches below the coccyx. On the left side close to the buttock of the autosite was a mass the size of a child's fist, very red, and discharging a watery secretion, that kept the parts

about it much excoriated. This afterward proved to be the peritoneal cavity and rudimentary intestines of the parasite. It was attached to the autosite in such a manner that the tis-

sues of the buttock projected over it forming a cuff about one and a half or two inches deep. It weighed between four and five pounds. Projecting from the most pendant portion were two rudimentary legs about the size and shape of a man's finger. One leg had one, and the other two toes, with well-formed nails.

The child was conscious when the parasite was touched.

I could never quite say the parasite had independent motion, but a peculiar motion of the child's hip made it move in a very suggestive manner.

The genital organs and anus of the child were pushed forward and when she sat down, as she sometimes did, she sat on the parasite. The child had a local reputation of being marked with a "turtle."

The parasite was removed with no great difficulty. The hardest feature was trying to anticipate what I should find. As I look at it now I wonder why I should have hesitated a

minute, but if you look up the literature and try to find precedent you will see why.

It became necessary to remove the coccyx as it was pushed back at a vicious angle and kept the flaps from coaptating properly. I dissected with blunt scissors and removed the growth entire. The upper portion was a sac containing a milky fluid, amounting to from four to six ounces. This lay in the hollow of the sacrum and it was necessary to bare the rectal wall about three inches.

I take it that the cyst was the remains of a cranial cavity. There was no serious hemorrhage, the hemostats controling it thoroughly. There was a hole left that would nearly contain the fist after I removed the parasite. This opening was closed by passing a fine catgut back and forth across it. The skin was closed with silk-worm gut.

It was impossible to control the child so as to keep her from soiling the dressings, consequently, we had a slight infection. The child left the hospital well the eighteenth day.

The photographs show the child before and after the operation.

I report this case, not because the operation was peculiarly a hard one, but because I think the specimen an extremely rare one.

CHAPTER V
EYE, EAR, NOSE AND THROAT

Acute Otogenous Temporosphenoidal Abscess; Diagnosis and Method of Operating

By Thomas Hubbard, M. D., Toledo

The symptoms of abscess of the brain present a considerable variation not entirely accounted for by the known pathologic conditions. The character of infection, location and size of abscess, meningitis, the source, previous pathologic conditions and temperament are all factors in modifying that group of objective and subjective symptoms which make diagnosis clear. This phase of the subject, the general feature of diagnosis of brain abscess, is very complex and I have limited my title to that class of acute brain abscesses which are recognized to be chiefly of otogenous character, traumatism excepted. In the cases to be narrated the variation in symptoms is pronounced and serves as a basis of study of diagnosis, and at the same time present interesting features from the surgical point of view.

Otogenous brain abscess occurs much more frequently in chronic than in acute suppurative otitis in the proportion of about ten to one. In acute and chronic conditions the suppurative process may invade any of the brain tissue contiguous to the temporal bone, the relative frequency being temporosphenoidal lobe, sigmoid sinus, and cerebellum. The tegmen tympani, that portion of the temporal bone above the tympanum and extending as far outward as the petrosquamosal suture, overlying as it does tympanum attic and supe-

rior mastoid cells, is usually the medium of transmission of infection to the meninges or brain. This thin shell of bone is perforated by numerous venous channels, and in the young the petrosquamosal suture being only partially closed, the dura is thus directly exposed to infection from the mastoid cells beneath. Epidural abscess is not a very rare condition in both acute and chronic cases of ear suppuration, and frequently escapes detection in cases in which the classical mastoid operation has been performed as it may readily drain into the freely opened cells or back into the tympanum or antrum.

As to the character of the infection, it is well understood that in this, as in general surgical conditions, the streptococcus type of suppuration is the more virulent and rapidly disseminated and the clinical course is usually of the fulminating type. No positive deductions, however, can be drawn from the study of the pathogenic germs in the discharges as there are so many modifying influences to be considered.

Chronic suppurative disease of the temporal bone is a very comprehensive subject and is not particularly under discussion, but the surgical features of acute otogenous brain infection are similar insofar as the details of the operation on the brain are concerned. It is absolutely essential to take into consideration the ear disease in considering any method of operation. The general surgeon, and also the otologist, may be led to slight certain features of the established method of mastoid and middle-ear operations in his zeal to get at and relieve the urgent symptoms arising from the brain abscess. Time is, to be sure, a very important factor, but on the other hand an imperfectly performed mastoid operation brings on serious complications and delayed healing. The primary object of the operator should be to determine the character of the ear disease. If it be a general mastoiditis, then all infected cells must be ablated even to the inner table in all directions, the classic or Schwartze operation. If the tympanic attic is the seat of active suppuration and ossicles more or less necrosed then the Stacke

operation, somewhat modified, is indicated. In either case the next step is to approach the middle cerebral fossa by way of the tegmen tympani. The dura should be uncovered broadly and as far externally as the squama and even a portion of the squama removed.

An epidural abscess, a small circumscribed one, above the tympanic cavity would thus be exposed. A careful inspection of the dura may show the point of invasion. It may be merely a small patch of plastic lymph or clearer indications of point of invasion may be noted. Usually in abscesses of any considerable size the dura is dark and bulging. The normal brain pulsation disappears under simple tension and its absence is not a positive sign of abscess. The primary incision through the dura should be as near the point of invasion as possible. The method of otologists differs from that usually advocated by the general surgeon in that the latter approaches the dura of the middle fossa by trephining the squama. This is the rapid method but it has radical defects. An epidural abscess over the tegmen may escape detection; the dura and cortical brain tissue is not incised along the track of primary invasion; and the liability to miss a small deep abscess is greater than when the puncture is made in an upward and inward direction; the abscess once located the drainage is better when opened from below.

The operation conducted as the classic mastoid broadens the field of operation and facilitates the examinations of the sigmoid sinus and cerebellum in case the abscess is not located in the temporosphenoidal lobe.

Some of the surgical features above mentioned, and special diagnostic symptoms are exemplified in the two cases of acute temporosphenoidal abscess which will be briefly described:

Case I: A girl, aged 14, was very healthy prior to her present sickness. She had had several attacks of otitis media with more or less prolonged suppuration in childhood, but there was no evidence of chronic disease of the middle ears.

About December 25, 1903, she had an attack of double otitis media with several days of severe pain relieved only by free discharge from both ears. On January 1, there was an acute exacerbation of all symptoms. High temperature, vomiting, delirium, frontal headache on the left side, and stiffness of the muscles of the neck followed. The discharge continued free. She was seen at this time by the family physician but as all severe symptoms abated the condition was not regarded as serious. The discharge ceased gradually and hearing returned in both ears. Then followed a very insidious decline in general health with progressive emaciation although her appetite was fairly good throughout. During the week prior to my first visit she developed that peculiar mental state characteristic of brain abscess. She was about the house as usual and was often cheerful and bright, but when alone and undisturbed she would lapse into a dull, listless state and would sit holding her head or rolling it from side to side. At such times she would comprehend with difficulty what was said to her. This mental state gradually became what is designated by McEwen as that of "retarded cerebration."

Even at this stage the family, more than ordinarily good observers, felt no particular anxiety, and called the family physician only twice. In fact, the only symptoms that were definite were daily frontal or occipital headaches and restless sleep broken by crying out and grinding of the teeth. Removal to the Hospital for closer observation was advised as it was impractical to see her frequently as her home was in the country; but the advice was not heeded. These more or less vague symptoms culminated in more definite manifestations on January 25, three weeks from the primary symptoms of a central lesion. There was a convulsion, or violent chill, vomiting, and alarming collapse. Several attacks of vomiting followed. I saw her in consultation on January 27 and found her dressed and about the house as usual. Her mental state was decidedly dull. The pulse was very rapid at first, but when quiet it dropped to below 70. The temperature was 97°. She complained vaguely of left-sided frontal pain. The hearing was about normal and only a small purulent scab was visible in the fundus of the left canal. The mastoid was normal. The diagnosis of cerebral abscess was made, and the family consented to removal to St. Vincent's Hospital for operation. Following admission to the Hospital she developed right-sided facial

paralysis and left-sided paresis of the tongue. The pulse was only 40 to 50, and the temperature 96 to 97°. She had three convulsions, the last while preparing for operation, seeming to begin in spasm of the right hand and arm.

Assisted by Dr Donnelly and Dr Krinian the classic mastoid operation was performed. The cells in the cortex were in normal condition and only in the antrum was pus encountered. On removing the tegmen above and external to the attic there was found an epidural abscess containing nearly a dram of pus. The dura was exposed above the tegmen and a portion of the squama removed. There was decided tension and bulging, no pulsation, and the dura was dark over the area of the abscess. A puncture by curved bistonry in an inward and upward direction liberated pus at the depth of about three-quarters of an inch. The dural incision was then enlarged sufficient to permit free inspection of the abscess cavity. About one and one-half ounces of pus escaped, and through the Whiting cephaloscope necrotic debris was mopped out by gauze strips. The cavity was gently packed with iodoform gauze. The operation required one and one-quarter hours. The pulse was about 110 as compared with 50 prior to operation. Gradually the temperature rose several degrees. An hour after operation there was paralysis of the internal rectus of the right eye, which gradually changed to paresis of the external rectus of the left, leaving a convergent strabismus which persisted for several weeks. Optic neuritis continued for two weeks or more.

The temperature was between two and three degrees above normal for three days. The head pains persisted for some time and the patient became somewhat hysteric, emotional and petulant. The appetite and general condition improved steadily. Dressings were made daily until the brain abscess had healed. There was a considerable hernia but it receded as the dura cicatrized. Pus from the abscess showed a mixed infection, staphylococcus and pneumococcus. The dura healed in about eight days, and the patient was dressed and about the Hospital in four weeks.

Facial and ocular paralysis disappeared in about six weeks, and except impairment of hearing in the left ear and narrowed auditory canal, she progressed to a normal condition mentally and physically.

This case presented the classic symptoms of brain abscess and no unusual difficulties were encountered in diagnosis or

operation. The epidural abscess gave a clear indication of the location of the cerebral abscess. It is worthy of comment, however, that an operation uncovering the dura by the method advocated in works on general surgery, that is, removal of a portion of the squama, the epidural abscess might have escaped detection and the incision through the dura and temporosphenoidal cortex would not have been at the seat of original infection.

Summary: Otitis media purulenta acuta; meningeal invasion in about one week with characteristic symptoms; epidural abscess formation; cerebral abscess; classic symptoms during the fourth week; operation four weeks after symptoms of meningeal infection; recovery.

During the same period a case came under observation presenting a strong contrast to the above and terminating in autopsy instead of recovery.

Case II: December 12, 1903. A farmer, aged 60, in normal health, suddenly developed acute osteomyelitis of the mastoid. The primary pain, tenderness and edema were in the posterior portion of the process, the middle ear and osseous canal being involved by extension of the general periostitis several weeks after the mastoid infection. In fact, there was at no time any appreciable discharge from the ear, and it was probably on account of this unusual sequence of pathologic conditions that the disease progressed to the condition where nearly all of the temporal bone and contiguous occipital were involved. He was sent to St. Vincent's Hospital during the tenth week of sickness and at that time was taking morphin in half-grain doses *ad libitum*. His condition was that of general septicopyemia, with albumin in the urine, and my first impression was that it was a case of chronic nephritis with a local infection. The tissues over the mastoid and sternomastoid and also in the posterior cervical triangle were much swollen and tender, and the external auditory meatus nearly closed. The temperature was 102°, and he had pain in the frontal and occipital regions.

Assisted by Drs Peter Donnelly and W. S. Powell, of Defiance, I operated February 27. The classic mastoid operation was performed. The cortex was decidedly sclerosed and all mastoid cells filled with pus, even those above the canal, and the removal of all infected bone tissue exposed

the dura in the middle fossa. Posteriorly the occipital bone was involved for about an inch back of the temporooccipital suture, large cells in the substance of the occipital being found full of pus. Over this whole area all bone tissue was removed down to the inner table. Below all of the aponeurotic tissue attached to the mastoid tip and base of the occipital even as deep as the rectus capitis was softened and infiltrated with pus. A deep abscess was opened beneath the sternomastoid, there having been a Bezold perforation. All of the veins in this area, including a large mastoid emissary, were thrombosed.

The operation was unusually tedious owing to the sclerotic condition and extensive area of the bone involved, and as the patient was in extreme collapse at the end of three hours of anesthesia, neither dura nor sinuses were further examined.

He rallied from the shock of operation, albumin disappeared from the urine, and septicopyemic symptoms subsided in three or four days. For five days subsequently he improved and then had two degrees of fever for three days and complained of pain in the posterior part of the operated region. There was a slight purulent accumulation in one of the deep occipital cells, and the indications were that deeper cells were infected. Healing progressed slowly in this region and the occasional pain of which he complained seemed to originate from this area. After a few days he improved decidedly and during the third week was dressed, and as he often said felt as well as he ever did. Had not the weather been very cold he would have been allowed to return to his home.

On March 6, 39 days after operation, he had a night of restlessness with frontal pain, and again on the next night. Local conditions were normal, and there was no systemic disturbance. On the morning of the eighth, as he was dressing, he had an attack of vertigo. Soon after he vomited his breakfast. When I saw him he was in apparently normal condition, except that he had symptoms of having taken cold, sneezing, coryza and facial neuralgia, with redness and swelling of the left side of the face. During the day he was somewhat drowsy and in the evening the temperature began to rise. Through the night the nurse reported that he became comatose, temperature rose to 105.4°, and he died early in the morning, within 24 hours of definite symptoms.

Autopsy (limited to cranial cavity).

The cranial cavity was examined and I found a rather small temporosphenoidal abscess which had ruptured and the surrounding brain tissue had undergone softening even to the lateral ventricle. The abscess wall was very firm and lay in the center of the temporosphenoidal lobe. From a surgical standpoint it would have been rather difficult to evacuate. An ordinary trocar would scarcely have penetrated its wall, but would have simply crowded it into the yielding brain tissue. A very short bistoury would have been the only instrument to have been used successfully, and it would have necessitated a deep puncture to have reached it. The point of election for puncture would have been directly upward from the tegmen tympani or a little external thereto. It would have been easily missed except by a bold and thorough search. The brain and sinuses otherwise normal. The point of infection was probably through the tegmen.

Summary: Mastoid and occipital osteomyelitis; a state of septicopyemia due to extensive suppuration and thrombosed veins external to the sinuses; postoperative symptoms were a moderate degree of pain and fever for about four days, apparently accounted for by extensive operation and a small residual area of infected bone in the occipital region; five days later he had two days of slight elevation of temperature; four weeks of satisfactory progress toward normal health; two days of vague symptoms of indefinite character, the only really suggestive symptoms being return of frontal headache; vertigo, vomiting, and 12 hours later rise of temperature with drowsiness, culminating in death.

The rupture of the abscess sac probably occurred about 48 hours before death and a second rupture into the lateral ventricle was the immediate cause of death.

DISCUSSION

Dr John A. Thompson, Cincinnati: If a student should attempt to learn his pathology and anatomy from the Transactions of the Ohio State Medical Association for the last few years he would conclude that the appendix was several

feet in length and several inches in diameter, that the Fallopian tube was capable of holding several gallons of pus. He would not, however, learn from the Transactions that there was such an organ as the ear subject to any dangerous diseases. I am glad that somebody has broken the ice and called attention to a field of surgery which has certainly been very badly neglected. Those of us who treat the ear see these neglected cases so often that they have come to be commonplace. It is generally recognized in the profession, both by the operator and by the practitioner, that pus everywhere else in the body is a dangerous fluid, that it should be evacuated, and the source of suppuration removed. This plain teaching of general pathology and general surgery seems to be neglected in the ear. The result is that we have cases of brain abscess or meningitis such as have just been reported by the essayist. Illustrative of this neglect I wish to report two cases in a brief way. The first case occurred in a young woman 20 years of age and was seen by me about 18 months ago. When about eight years of age she had an attack of measles which was followed by suppuration in the ear. Shortly before coming under my care she had been having severe headaches which would often last three days at a time and at these times the only position in which she could be at all comfortable was lying across the bed with her head thrown back over the edge of the bed. During these attacks of headache her temperature would run up to 102° and 103°. In spite of this decided symptom of meningeal involvement the family Doctor protested against any operative interference. For years this suppuration had continued and yet he advised against an operation. A radical mastoid operation resulted in a complete cure, and I am confident saved the patient from an attack of meningitis, if not from a brain abscess.

Last October I saw a similar case which came from the eastern part of the State. The patient was a man whose ear had been suppurating for 20 years. When he came to the city he had a large polypoid mass protruding from the external auditory canal. His temperature was 102°, and he complained of a constant earache. His family Doctor had sent him down to the city for operation. In this case the ordinary radical mastoid operation was made and the very first incision through the outer cortex revealed a polypoid mass growing in the mastoid cells. I cleaned out the parts

thoroughly, and for the first three days apparently everything went well, and then the case began to go badly. By the evening of the fifth day he had a temperature of 105°, a pulse of 70, was completely comatose and could not be aroused. It was as distinctly a developing case of meningitis as one would want to see, and was apparently a hopeless case. I will not go into the details of the treatment carried out in this case, suffice it to say the patient recovered and is now at his work as a contracting carpenter.

Cases of this kind in which suppuration has gone on for such a length of time with distinct meningeal involvement certainly shows neglect somewhere. Pus is as dangerous in the ear as anywhere else. As the essayist has said, when you get one of these cases with threatening complications an incision upward through the tegmen tympani does not add to the gravity of the case and perhaps will result in drainage and save a life. If the full duty of the profession was done these cases would come to operation much more frequently than they do before they have these grave symptoms.

Dr A. R. Baker, Cleveland: I am very glad indeed to have heard this interesting and profitable paper. If the last speaker will refer to the Transactions of this Society he will find that I brought this subject before the Society a good many years ago, indeed my first introduction to the Ohio State Medical Society was in connection with a patient which was brought to the meeting at Akron. Four prominent surgeons from as many cities were appointed to examine him and I was appointed as the fifth member of the committee. They examined somewhat superficially and gave it as their opinion that he had an incurable trouble and there was no help for him. I begged leave to make a minority report, and said that I believed the patient had a brain abscess, and that an operation might benefit him. In the presence of a number of members of the Society I made the operation the following morning and found a subdural abscess. The patient recovered. Several years afterward I read a paper before the Society on this subject and tried to arouse some enthusiasm, and I am only too glad to see that some of the younger men are taking up the subject and hope they will meet with much success.

Just one word more as to the choice of operations: For many years I made the same operation as that recommended by the author of the paper, and would often blunder upon a

brain abscess or a sinus thrombosis. I would then get scared and wish I had turned the patient over to a general surgeon, but somehow or other the most of them recovered. Later, in cases of suspected serious brain complications, I called in a surgeon. He made a much cleaner and apparently successful operation, but, for some reason the patients would not get well, and I was led to attribute the unsuccessful result, as suggested by the author of this paper, to the new channels of infection opened up in making extensive dissections through healthy brain and other tissues. Of recent years I have gone back to the old operation of attacking the brain or sinus diseases through the mastoid or middle ear, following any clew of dead bone or sinus or necrotic tissue as long as any could be found. While the operations have sometimes seemed blundering, and may not have been very skilfully performed from a surgeon's standpoint, yet my patients generally recover, and that, after all, is what we are here for.

Dr D. N. Kinsman, Columbus: If there is one subject upon which I think we have been lame it has been the recognition of cerebral abscess in connection with ear diseases. Of all diseases in which an exploratory operation simply and solely for the purpose of diagnosis is warranted this is certainly most important, and I would recommend an exploratory operation in these cases of suspected ear disease more quickly than I would in any other form of disease. I have seen the bony canals opened, and yet an abscess was not found, and yet I have seen more cases in which the abscess has been found. I am not the only man in the world that fails to diagnosticate an abscess. When such men as Ballance, of England, confess their failures in the diagnosis of cerebral abscesses due to suppurating ear troubles I think we can take heart ourselves. Last of all I wish to say that I never allow a case that I can control to die from abscess of the ear from a lack of opportunity to have an operation. In some of the cases the operation discloses no pus even after the cranium is opened, but I would rather have the credit of having called in a surgeon who would make a successful operation which does not bring any benefit except along the line of diagnosis, than to allow a patient to die without an operation when he ought to have it.

Dr Thos. Hubbard, Toledo, closing discussion: Many important features of the diagnosis and treatment of brain abscesses have been added by those taking part in discussion.

In closing I would like to call particular attention to the Whiting cephaloscope. In many instances the contents of the abscess are not altogether liquid pus, but often necrotic masses are found which would block an ordinary drainage tube and cause a residual abscess. The cephaloscope (the smaller size passed for inspection) makes it comparatively easy to clean out all parts of the pus cavity at the time of operation and further it facilitates subsequent dressings.

Three Recent Cases of "Croup"

Due to Staphylococcus and Requiring Tracheotomy

By F. P. Anzinger, A. M., M. D., Springfield

Croup is a term which has by time and usage earned a permanent position in our medical vocabulary, and yet with the progressive development in modern pathology, its meaning grows steadily more ambiguous. Heretofore such prefixes as "true," "pseudo," "membranous," etc., helped to designate the special form intended; for example, membranous croup meant laryngotracheal diphtheria due to the Klebs-Löffler bacillus. Billings in a bacteriologic analysis of 286 cases of membranous laryngitis showed 80% to be due to the Klebs-Löffler bacillus and 20% to streptococci and diplococci. We also know that pseudomembranes may be induced by the local action of chemical and physical agents. Gould's Dictionary defines croup as a "disease of the larnyx and trachea of children, prominent symptoms of which are peculiar cough and difficulty in breathing; it is often accompanied by the development of a pseudomembranous deposit or exudate upon the parts."

The latest authorities still differ as to the proper interpretation of various prefixes placed before the term croup. Jonathan Wright in his latest text-book on nose and throat diseases gives a special heading entitled "Acute Catarrhal Laryngitis in Children"; this title will best include the cases to be described in this paper. The clinical characteristics of acute laryngitis are familiar to every medical practi-

tioner and I shall proceed at once with three interesting cases which came under my observation last winter:

Case I: A male babe, aged 11 months, was of fair build and had always been well. On December 1 the mother had "aching in the bones," a chill, fever, sore throat, and enlargement of the cervical glands. The next day the older of her two children, aged three, was taken sick with the same symptoms.

On the third day the babe was similarly affected and drowsiness was especially noted. The mother was well in about 10 days but the children continued in their ailment, some days better, then again worse. After domestic remedies had been used for two weeks, Dr Vance was called who pronounced the condition tonsillitis. He found the temperature ranging from 100° to 102° and on several visits the same was normal. At the end of the third week the babe became "croupy" and the glandular swelling on the right side of the neck became larger and more diffuse simulating a cellulitis. The next day the breathing was more labored and with a distinct stridor audible all over the room. The following night strangling spells caused much anxiety. The following morning the symptoms subsided, but the breathing was still labored.

At noon I was called to make a bacteriologic examination of the throat. I found moderate hyperemia and swelling of the pharynx, but no membrane. The throat swabs showed microscopically the presence of a few saprophytic bacilli and a predominance of diplococci. Late in the afternoon the child had a temperature of 103°, weak and rapid pulse, pallor and cyanosis, and beginning coma. Tracheotomy had been advised the day before but was refused. Consent now being given, the chances even with operation were very doubtful. Dr Rind did a "high operation" and on opening the trachea nothing more than a slight congestion with small quantity of mucous exudate was seen. Probing toward the larynx this was found occluded by intense swelling.

Swabbings taken from both larynx and trachea showed on subsequent examination pure cultures of a diplococcus. Respiration gradually became rythmic and 30 minutes later the child was placed in bed quietly breathing through the tube. The color and pulse improved rapidly. From this time on a tabulated record was kept which showed for the following few days a temperature ranging from 101° to 104°, pulse 135 to 140, and respiration 40 to 50.

The cellulitis on the right side of the neck subsided within the next two days but the swelling in the larynx continued for five days. Hereupon the breathing was reestablished through the natural channel and the tube was left out altogether. Strict asepsis was observed throughout, but considerable suppuration occurred in the wound, due, probably, to the organism found in the trachea. The wound healed by granulation in two weeks. The child made a perfect recovery and is well today. In passing, it may be mentioned that the nurse who waited on the mother during her illness was taken with sore throat and glandular enlargement the week following her departure; moreover, the daughter of the nurse was similarly affected.

Case II: A female, aged four years, quite plump, had always been well with the exception of throat trouble during the winter months. About four weeks before the present trouble the whole family, including father, mother, and two children, had mild sore throats. Dr Rind was called several times to see the patient aged four, as she seemed to be worse than the others. He found nothing significant and made a diagnosis of tonsillitis. On January 7, about three weeks from the onset, the patient had "croup" symptoms. Dr Rind being ill, Dr Vance was called, who found a temperature of 101°, pulse 130, high falsetto voice, and respiratory stridor. On the same day I was called to make a throat examination and found moderate swelling and congestion of the pharynx, but no membrane. The throat swabs showed a few noncharacteristic bacilli and a predominance of diplococci. It was evident from close clinical observation that the obstruction was both mechanical and spasmodic. During the afternoon the condition grew progressively worse and 5000 units of antitoxin (Mulford's) was given as an extra precaution. About two hours after this the child had its worst strangling spell, and the nurse thought it was dead.

I arrived 15 minutes later and found the child recovered from the attack but in general the condition was worse than before. In the evening four physicians in consultation decided that operation should be done. The temperature was now 102° and pulse 130. At 9 p. m. Dr Rind opened the trachea high up which was difficult owing to the excessive adipose tissue and engorged veins.

When the trachea was incised no air entered and we feared membrane. However, on closer inspection a diaphragm was visible extending obliquely across the lumen of

the trachea and on puncturing this air entered with a gush. This diaphragm must have been either an anomalous structure or an old organized membrane for it was quite firm deep pink and not unlike the surrounding mucosa; moreover, no other evidence of pseudomembrane was found. The larynx was impervious on probing.

Smears taken from the mucosa showed diplococci in a pure state. A small quantity of frothy mucus was blown up through the tube from the bronchi. The child was placed in bed breathing perfectly and with good color and pulse. About one hour after operation the temperature was 103°, pulse 130, respiration 30.

Stimulants were given freely. Next morning at three o'clock the heart began to fail and this continued until the following afternoon when the child died apparently from profound toxemia. Just before death the temperature was 107° (per rectum), pulse 150, and respiration 50. At this time my incubator cultures developed sufficient to show the absence of bacilli. The clinical phenomena were so unusual and suspicious that my bacteriologic findings were accepted, but not without some hesitation.

Case III: A male, aged five years, had measles at the age of two years, but was otherwise well. The tonsils were chronically enlarged and each winter he would have sore throat and "croup." On January 28 the child had one of its familiar attacks of sore throat and three days later the voice was hoarse and the cough "croupy."

During the night he had several choking spells. Next morning Dr Seward was called who found the tonsils filling the throat, but no membrane. The symptoms at the time of his visit had subsided. In the afternoon drowsiness occurred and all night the child struggled for air. Next morning Dr Rind was called into consultation and at this time the condition was so grave that he hastened for his instruments and assistants. I was called to make a throat examination. The patient was already on the table with the trachea opened. I took my culture smears through the wound and from the mucus blown out from the tube. Microscopically the smears showed only diplococci, which were numerous. The mucosa appeared congested and the larynx was swollen shut but no membrane was found. I was told that the child was blue and comatose before operation and no anesthetic was required. Antitoxin (5000 units) were given at the time of operation. The breathing and color

improved after the tube was in the trachea, but the pulse remained weak and the child died about two hours after operation. At my request Dr Vance procured a section of the larynx, the findings of which I shall report farther on in this paper.

Cases I and II lived in the same block, Case III lived eight squares from the other two, and no evidence could be secured making it probable that a contagion was carried from one to the other or from outside sources. It may also be stated that the three cases occurred in families in comfortable circumstances and the hygienic environment was good.

The bacteriologic investigation of these cases involved about four months of research, a complete report of which would be impractical in this paper. I shall merely give a synopsis of this work. Unfortunately in Case I the cultures were destroyed after a few days growth.

However, the essential characteristics of the organism, both microscopically and culturally, together with the extensive suppuration, leads me to believe that it was similar to that found in Cases II and III. In the last two instances the cultures were carefully grown in both incubator and room temperature.

The findings in Case II were as follows:

On moist streak agar pin-point colonies were visible after 12 hours growth in the incubator at 37° (C.). The mature colonies consisted of a slightly elevated slimy mass with smooth wavy border and varying in color from milky white to canary yellow. The color characteristic of the colony was at times lost in transplanting. Blood serum tubes showed almost the same appearances.

In buillon, rapid clouding with subsequent deposits of granular pigment was produced. Stab cultures in gelatin showed finger-shaped liquefaction with pigmented deposit in the pendant part. Gelatin plates contained pin-point grayish colonies which soon enlarged giving rise to saucer-shaped depressions and final liquefaction of the medium. In litmus

milk slow coagulation and acid formation occurred, the casein was subsequently liquefied. The cultural tests in Case III were almost identical excepting the pigment variation was less marked. Besides this a few of the original cultures were contaminated owing probably to the fact that the field of operation could not be properly prepared and dispatch was certainly paramount in this instance. Microscopic examination of these cases proved the organism to be a coccus occurring single, more often in pairs and frequently in clusters. The individual organism varied in size which was especially noted in those composing the short chains found in the liquid media. The cocci stained both by simple anilin dyes and also by Gram's method. Variation in the intensity of staining was observed in many instances.

From the above observations I was assured that the organism was the staphylococcus. The irregular behavior of the pigment led me to omit any conclusion as to the prevailing type of staphylococcus involved. Coincident with the cultural work the pathogenesis was determined by inoculating white mice.

In Case I, as stated before, the cultures were destroyed. In Case II the staphylococcus grown on blood serum for three days in the incubator (37°) was transferred to buillon and after 12 hours growth was injected subcutaneously near the root of the tail in two mice. One received five drops and died within 16 hours; the other received 10 drops and died 11 hours after inoculation.

Postmortem examination on the mice showed slight changes consisting mainly of congestion and moderate edema of the tissues. Smears and cultures taken subcutaneously intraperitoneally and from the blood showed cocci in large numbers. Microscopic sections of the organs showed small numbers of the same organism. The peritoneal smears revealed marked leukocytosis and many phagocytes loaded with cocci were witnessed with much interest. The pathogenesis having been in a measure ascertained I next attempted to determine the degree of virulence and probable

means of accidental infection. Healthy mice placed in the infected cages remained well. Contamination of food and drink with fresh cultures proved negative. After five weeks of incubator growth the organism in culture was again inoculated into healthy mice using the fresh buillon cultures, but these failed to kill even in large doses. Abscesses, however, formed at the point of inoculation. Cultures attenuated by three months' growth in the incubator were next injected into the peritoneal cavity of white mice. They recovered from the inoculation of five drops of fresh buillon culture but 15 drops killed within 24 hours and on postmortem examination overwhelming numbers of staphylococci were demonstrated by smears cultures and sectioning of the organs.

Cultures from Case III were similarly tested and practically the same results were obtained. Larger doses for intraperitoneal injection were necessary to kill which was either due to lesser virulence of the organism or more rapid attenuation by artificial growth. The section of trachea removed from Case III was sectioned and stained. Microscopically it showed small cell infiltration of the mucosa, submucosa and muscularis. The mucosa had a few superficial erosions upon which were deposited masses of cocci. There was no evidence of fibrin or pseudomembrane. Staphylococci in small numbers were also found in the interstitial stroma of the submucosa and striped muscle bundles.

To briefly summarize the essential points we have here three cases of preliminary sore throat in children followed by severe obstructive symptoms in the larynx and requiring tracheotomy. In none of the cases was there evidence of a pseudomembrane. The clinical symptoms pointed to a local infectious process with elaboration of toxins. In two of the cases the diagnosis of diphtheria were entertained, and antitoxin was given but with negative results. Bacteriologic examination revealed the presence of practically pure cultures of staphylococci in the trachea and larynx. The organism in recent artificial cultures proved to be unusually

pathogenic to white mice. Subsequent inoculations of the same strain of bacteria proved much less virulent. Pathogenesis was displayed only by direct inoculation into the lymph or blood circulation.

From an analysis of this investigation we may safely draw the following conclusions:

1. The winter epidemics of tonsillitis and sore throat in children at times give rise to laryngeal complications.

2. This condition is always serious owing to the ease with which the juvenile throat may be obstructed.

3. Individual predisposition to laryngeal complication is quite probable.

4. The staphylococcus, a common denison of the throat, may, under favorable conditions, give rise to grave symptoms, as exemplified in the above cases.

5. The rapidity of onset and severity of symptoms may at times suggest diphtheria.

6. A reliable bacteriologic examination of the throat is prerequisite.

7. Antitoxin although to be used in doubtful cases will be of no service in cases in which the Klebs-Löffler organism is not the causative factor.

8. The above may be taken as examples of cases at times diagnosed as diphtheria in which no microscopic examination is made. Moreover, the failures of antitoxin are often credited to such cases.

9. Finally, I would emphasize the importance of a careful analysis of each case being the diagnosis on both clinical and bacteriologic evidence.

DISCUSSION

Dr J. J. Thomas, Cleveland: I would like to raise a question as to the correctness of the diagnosis in these cases. I do not think it possible to exclude diphtheria in cases with such symptoms, merely from the clinical and bacteriologic examinations. To support this statement I would like to cite the case of a boy, five years old, brought to St. Anne's Infant Asylum one year ago, suffering from stenosis of the larynx. The boy's father had recovered from diphtheria

two weeks previously. There was no diphtheritic membrane in the pharynx. A culture was taken immediately and proved negative for Klebs-Loeffler bacilli, staphylococci alone being found. Antitoxin was given at once on general principles, and in a short time it was considered necessary to intubate. This was very difficult, and as there was considerable albumin in the urine, the question came up whether it was an edema of the larynx. Swabs were taken for four or five days, but each time proved negative. The boy eventually developed bronchopneumonia and in five weeks he died. On postmortem macroscopic examination of the pharynx and trachea revealed nothing abnormal. Nothing was found in the pharynx and larynx above the chords, nor was there anything on the chords, but below the chords there was a slight membrane. Swabs from this membrane showed no Klebs-Loeffler bacilli. On microscopic examination, however, Klebs-Loeffler bacilli were found imbedded in the membrane and in the mucosa of the chords. The spleen showed changes microscopically, which are described by Osler as pathognomonic of diphtheria. The autopsy was made in a most complete manner by Dr Dolly, now of Lakeside Hospital. Those who have considerable experience with diphtheria will at once admit the unreliability of the ordinary methods of bacteriologic examination. Some time ago I had a very marked case of diphtheria and the report from the City Laboratory was that there were no diphtheria bacilli present. I, of course, gave antitoxin at once. When another swab was taken the same report was received. Three days later the diphtheria bacilli were found. I should like to ask the Doctor why tracheotomy was selected in preference to intubation.

Dr F. P. Anzinger, Springfield, closing discussion: In answer to the last speaker's question in regard to why intubation was not done, the main reason was that we did not have anyone prepared to do the operation. Intubation is not as easily performed as we are often led to believe. It requires equally as much skill if not more than tracheotomy. I do not wish to go into detail as to the relative merits of the two methods. In these cases we did not have time and the man would not have been available. I wish to make myself clear that the diagnosis was based on both clinical and bacteriologic findings; possibly a little more the clinical. Proof of this is the fact that in consultation on the second case I

stated that inasmuch as the swabbing was taken only from the pharynx we have no assurance that the larynx is absolutely free from the Klebs-Loeffler organism and antitoxin should be given as an extra precaution. However, at the time of operation in each instance the lower respiratory tract was made accessible for bacteriologic examination and in Case III the postmortem tissue in section showed the absence of diphtheria bacilli. At the request of the local health officer the material was submitted to the State bacteriologist, who reported the absence of diphtheria bacilli. In conclusion I would again emphasize the importance of utilizing every means available for the diagnosis of these doubtful cases of "croup."

CHAPTER VI
OBSTETRICS AND GYNECOLOGY

Practical Deductions from Some Personal Experiences with Ectopic Pregnancy

By R. E. Skeel, M. D., Cleveland

Symptomatology and Diagnosis: It is well known that the classical descriptions of disease and the clinical pictures they present at the bedside oft-times vary widely. In no condition is this more evident than in the symptomatology of ectopic pregnancy. One of the most prominent of the text-book symptoms is that of missed menstruation, and yet menstruation may be present and the irregularities, if any, may have been so slight as not to attract the attention of the patient.

A case in illustration is that of Mrs E. W., aged 28, the mother of two children, whose menstruation had been regular. During the first week of April, 1903, while absent from the city, she had slight colicky pains in the pelvis for which she consulted a physician who considered her ailment of no importance. Her pain persisting, she came home and soon after her arrival she began flowing and fainted. Her family physician was called and suspected from the pallor and rapid pulse that concealed hemorrhage of some sort must be taking place and that its most likely site was the abdominal cavity. Physical examination was entirely negative, and as her condition was not extreme and the diagnosis in doubt, she was removed to the hospital and carefully observed for 24 hours. During this time her condition was practically stationary but slight dulness made its appearance in the flanks and rendered the diagnosis more nearly positive and exploration imperative. The abdominal cavity was opened and revealed a ruptured and bleeding right tube and a large amount of free fluid blood. Convalescence was smooth and rapid and within six months the patient again became pregnant and aborted.

Subnormal temperature is also a text-book symptom but much harm has been done by forgetting that the lowered temperature of hemorrhage and peritoneal shock is apt to be succeeded by slight and sometimes extreme elevation as reparative peritonitis sets in. Missed menstruation with irregular slight bleeding, "spotting" is always referred to as a suspicious circumstance, and such it undoubtedly is, especially when associated with unilateral pelvic pain, but menstruation may be missed, no irregular bleeding occur, and no pain be noticed.

This was the condition found in the case of Mrs T., aged 24, the mother of one child two years of age, who considered herself normally pregnant at two months. Without the slightest premonitory warning she was seized with excruciating abdominal pain and became unconscious. She was in extreme shock and barely able to answer questions when seen two hours later. In this instance, as well as the foregoing, no physical evidence of a lateral mass was ascertainable, both because of the obese abdominal wall and because there had been no time for the formation of a clot and reparative peritonitis to occur. The tube could not be palpated, the pain had entirely subsided, but there was localized tenderness upon bimanual examination. The diagnosis was necessarily by exclusion. In this, as well as in the preceding case, it was almost impossible to rule out the attempted induction of criminal abortion since collapse often occurs from the introduction of fluids under pressure into the uterus, and patients' statements under such circumstances are wholly, and frequently intentionally, unreliable. A diagnosis was finally established after assuring the patient that a misstatement might cost her life. Operation was performed at once at the patient's home and a freshly ruptured, freely bleeding left tube ligated and removed. She has since that time borne one child.

The absence of ordinary and characteristic local symptoms sometimes renders it necessary to resort to exploratory operation when the general condition leads one to suspect a ruptured ectopic pregnancy. Exploratory abdominal section is of serious import if undertaken in the face of shock, low blood-pressure, etc., unless the diagnosis is clear enough beforehand so that there is a reasonable ground for the belief that a bleeding vessel can be found and ligated, or the evidences of peritoneal irritation are so marked that they furnish definite indications for operation.

In the absence of such conditions vaginal section is much more rapidly performed, has a minimum of danger from shock and confirms or negatives the diagnosis while the patient is in position for preliminary curetage. If the diagnosis is correct, and the peritoneal cavity contains free blood, two or three sutures close the incision and the whole procedure need not take more than five minutes. The abdomen can then be opened from above and the condition dealt with in the ordinary way.

This was the method adopted in the case of Mrs B., aged 34, the mother of three children, the youngest five months old. She had menstruated but once or twice since the birth of the last child and was unaware of any pelvic trouble. During the early morning of June 23, 1903, she turned in bed and experienced some abdominal pain which she could not locate. At the same time she began to flow. Her physician was called and examined her carefully, but was unable to locate anything abnormal in the pelvis. Precisely the same occurrence took place the next night. The pulse was not markedly elevated, the attack of pain was short, and the slight flow continued. Anchylosis of one knee made vaginal examination very unsatisfactory, but an indefinite sense of resistance was found in the left vaginal vault. Under ether this was more marked and curetage removed so large a quantity of deciduous material that the case was considered to be one of abortion with infection of the left ovary. Owing to the uncertain history, however, a posterior vaginal incision was made and there immediately followed a gush of bright arterial blood and a few recent clots. The vaginal vault was closed, suprapubic laparotomy performed, and it was found that bleeding which had previously ceased had begun anew, undoubtedly because of the manipulation during examination and curetage.

The practical deductions which I should make from my experience with these three cases are that the characteristic local symptoms may one or more be absent, the physical evidences be absent or indefinite but that hemorrhagic shock in a child-bearing woman with any symptoms pointing suspiciously toward the pelvis is sufficient justification for exploratory operation for purposes of diagnosis, and in those instances in which serious doubt exists vaginal section offers the safest and quickest method of clearing up that doubt.

A long period of sterility is frequently mentioned as an almost necessary antecedent of ectopic pregnancy, but of 15 cases of which I have notes, three were primipara, two had been married less than a year, one four or five years; the remaining 12 had borne from one to five children and in none of these instances had an unusual time supervened since the last pregnancy. Fourteen of these cases were operated upon and the condition of the other tube ascertained in 12. Pyosalpynx existed in one, tubo-ovarian cyst in one, one case had but one tube and ovary as I had removed the other for a dermoid with twisted pedicle a year previously. In the latter case pregnancy at four months existed at the time of the first operation and miscarriage took place on the third day following. The tube, which was later the site of pregnancy, must have been the one through which the ovum passed at the previous gestation. In one instance both tubes were intact to the cornua of the uterus, interstitial pregnancy was present with rupture of the uterine wall. Of the remaining eight cases with macroscopically normal tubes four have since been pregnant.

It is obvious that something more needs to be ascertained concerning the pathologic conditions antedating the abnormal pregnancy and that if tubal disease be the cause it must frequently be unilateral. If any deduction could be made from so limited a number of cases it would be that the condition is more common in women actively engaged in the function of child-bearing than in those sterile for a long period of time. Tubal abortion is a term often used to explain the cases in which recovery has taken place without operation, and one author of note insists that tubal abortion is more common than tubal rupture.

The condition of the tube could be ascertained in 11 of the 14 cases operated upon, and it was ruptured into the free peritoneal cavity in all of them. The severity of the symptoms due to rupture and hemorrhage seemed to depend upon the location, rupture near the uterus causing the most profound and sudden depression. Of the remaining three cases one had suppurated and formed an extensive abscess, the other two had vaginal incision and drainage only. While tubal abortion may occur it seems best to consider

that cases presenting symptoms severe enough to be brought to the attention of the surgeon are probably instances of tubal rupture.

Treatment: Some cases undoubtedly recover without treatment. One in this series did so having been first seen 10 days after the primary rupture. No evidence of infection or secondary hemorrhage following, she made a slow but satisfactory recovery with simple rest in bed. Fourteen cases were operated upon, two by vaginal incision, one recovered and one died. The one that died deserves more extended consideration.

Her last menstrual period was in September, 1902. For a period of four or five months she considered herself to be normally pregnant but the first appearance of enlargement of the abdomen was to the right of the median line. During this time she was not well but did not consider herself ill enough to be in bed. In the early spring, the dates could not be ascertained with exactness, she had some pain in the abdomen and upon one occasion became quite faint. In May and June she had what her physician termed attacks of peritonitis with irregular temperature, vomiting and abdominal pain. July 18, when first seen in consultation, she had been confined to the bed for a month, was extremely emaciated, with rapid pulse and occasional elevation of temperature, together with profuse sweats. Examination revealed a mass extending from the posterior vaginal *cul-de-sac* to the umbilicus, more marked upon the right side. A moderate enlargement of the heart with some irregularity of pulse and faint mitral murmur were all attributed to a previous attack of rheumatism. Diagnosis was ectopic pregnancy, hematocele and suppuration within the sac: a vaginal incision was made with the object of drainage. The interior of the mass was explored with the finger but nothing but old laminated foul-smelling blood clot was discovered. Upon removing the finger profuse hemorrhage occurred both from the edges of the incision and interior of the mass and was not controlled until the cavity was firmly packed and the incision tightly sutured. The temperature at once shot up to 105° and rapidly returned to normal but the pulse remained fast. Irregular variations of temperature with slight chills were now observed, but her general condition was somewhat improved. Removal of the gauze upon the fifth day was accompanied by a return of the bleeding which for a time seemed uncontrollable. It was eventually checked in the same manner as the first and the patient sur-

vived 10 days longer, dying with unmistakable evidences of septic endocarditis. It is altogether likely that this condition was present at the time of operation but its manifestations were attributed to her previous attack of rheumatism and toxemia from the supposed suppurating focus. Delay was, therefore, primarily responsible for this death.

Abdominal section was performed upon 12 cases, six during shock and while bleeding from primary rupture was still present. One of these cases died. She had been under observation for several days but the diagnosis was in doubt. She had a pelvic mass, but this was known to have been present a year and had caused repeated slight attacks of peritonitis. She had been for years a semi-invalid and her general condition was wretched. The time was set for operation and just before it arrived distinct evidence of severe hemorrhage appeared. Laparotomy revealed an abdomen full of blood, a tuboovarian cyst upon one side and a freely bleeding tube ruptured near the middle upon the other side. Both were removed and the patient rallied from the profound shock under intravenous infusion of adrenalin and saline solution. She was kept alive for four days by heroic stimulation but eventually succumbed. This patient would undoubtedly be alive today had an operation been possible an hour or two sooner. Of the remaining six cases, two were operated upon after secondary rupture of the primary hematocele with recovery, one during the sixth month with a living fetus with recovery, one during suppuration of the hematocele with recovery, and one two months beyond full term with death on the tenth day from tetanus. The latter case also deserves more extended consideration.

This patient had thought herself normally pregnant and nothing peculiar in her history of pregnancy could be elicited except the painfulness of fetal motion. At full term spurious labor supervened and lasted several days, the breasts filled with milk and fetal motion ceased. She first came under my observation six weeks later when the breasts were again flabby. There was considerable abdominal pain at irregular intervals and the condition of general malaise was such that she was able to sit up only a portion of the time. Examination revealed an abdominal tumor, freely movable but inclining to the right side, in which the fetal parts were palpable with startling distinctness; there was no motion,

no fetal heart sounds and no bruit; under the costal arch the head could be palpated. Vaginal examination showed a moderately enlarged uterus pushed to the left, a deeply lacerated cervix through which the finger could be inserted and a pale and gaping vagina. After several days observation and confirmation of the diagnosis by repeated examinations, the patient was operated upon December 28, 1901, just 11 months from the last menstrual period. The omentum was adherent under the incision and was ligated and removed, when a thin translucent sac, through which the fetus was visible, came into view. No other evidences of an inflammatory sac, such as is usually present in these cases, could be found, and upon various portions of its surface the sac was directly adherent to intestine upon one side and projecting portions of the fetus upon the other. Owing to this peculiarity the abdominal cavity was somewhat contaminated by the contained fluid which had the odor characteristic of abscesses in the vicinity of the intestine. The child was removed and the placenta sought. It could be plainly felt but its exact location was puzzling until the entire pelvic cavity was exposed and the uterus and appendages brought out when it was found, shaped like an inverted mushroom, in the upper portion of the uterus. Both tubes were intact to their entrance into the uterine wall, and the case must have been one of interstitial pregnancy with rupture of the fundus. That portion of the uterus above the tubes was amputated and the fundus closed with chromicized gut. The incision was partly closed and gauze drains inserted into those parts of the cavity which were known to be soiled. The patient's condition was precarious for three days with high temperature and rapid pulse, during which time she received repeated hypodermic injections and saline infusions. From the fourth until the eighth day recovery was apparently assured. At the latter date she complained of stiffness of the neck; rigidity of the masseters and all the symptoms of tetanus rapidly developed and death supervened on the tenth day. The possible sources of infection were carefully gone over, all packing and the abdominal sutures and catgut from the same supply were submitted for bacteriologic examination without result. Two other possible sources of infection were present, the water used for the saline solutions and possible latent infection in the patient's genital tract. Boiled water only was used but such sterilization as is ordinarily given by one boiling is not sufficient to destroy tetanus spores. The wide open vulva and cervix together with the close proximity of the patient's rooms to a stable make this a possible source of contamination but no definite decision has been arrived at as to which of these factors was responsible for the

catastrophe. My own feeling has always been, however, that if I had performed total hysterectomy the patient might have lived.

Of the 14 cases operated upon, three died, a mortality of 21% which is truly excessive, but analysis reveals the real source of such high mortality. Two of the deaths were due to procrastination, the other to one of those accidental infections which will occasionally occur and which gives an appreciable mortality rate to any and all operative work.

The mortality rate for cases going on to a spontaneous termination has been found to vary in different series of cases from 42 to 80%. It is indeed probable that 50% is a very low estimate. On the other hand the convalescence of extrauterine cases treated by early operation is remarkably smooth and painless. Marked objection has been raised to operation during shock from primary hemorrhage, but it is well known that patients in shock from a single severe hemorrhage bear operation better than those reduced to the same condition from repeated slight ones.

No abdominal surgeon would dream of deferring from day to day interference in a case of slipped ligature following oophorectomy even though his patient should temporarily improve and there seems to me to be no legitimate ground for such action in ruptured ectopic gestation if the diagnosis is at all certain.

In conclusion I should say that a low mortality rate in ectopic cases can be gained only by an early diagnosis established by frequent and repeated observation, definitely confirmed if need be by vaginal section and exploration, and operation at any period provided the diagnosis is reasonably certain; and, fortunately for this view, the condition in early cases is rarely so extreme that imperfect preparation and precipitate operation are necessary.

DISCUSSION

Dr C. E. Beardsley, Ottawa: I see quite a number of gentlemen here who are laparotomists and gynecologists. I simply rise for a pointer that I may discover the etiology of those cases. I have seen five cases of ectopic gestation. One survived the operation and the other four died without operation. My observation on those cases is this: Out of the five, four at least had gonorrhea prior to the ectopic pregnancy. One or two to my own personal knowledge had it some two or three years prior. Out of the five cases I am

pretty sure that the whole five were subjects of gonorrhea prior to this condition, and it has been my opinion that most of the cases of ectopic gestation depend upon a trouble of this sort; the ciliated epithelium of the tubes being destroyed or denuded and thus the ovum has not been able to pass into the uterus. Now, I would like to hear from those gentlemen here and learn if I am right or wrong. It is my opinion from my meager observations and autopsies that gonorrhea has been the etiology of the great majority of cases.

Now, as far as the operation is concerned, there is no mistake that the sooner the diagnosis is made and the operation performed, the better chance for the patient. Referring back to the five cases mentioned above, one of them seemed to menstruate with regularity, while four of them thought they were pregnant and passed along until pains commenced, tenderness, etc., and the reason you could not get an operation upon them was that most of them were German Catholics. If you know about that Order, which some of you do, you will know that it is very difficult to get an operation in those cases. The etiology of those cases is what I am more particularly interested in, and I would like to hear from the members generally. The technic of the operation is broad and has been well stated.

Dr W. H. Humiston, Cleveland: Dr Skeel has read a very interesting paper, and his detailed reports show that he has treated the cases according to up-to-date methods, and the results obtained under the conditions are all that could be expected. I agree thoroughly with him that delay in operating in most cases is the cause for a high mortality.

The statement so frequently made that a pre-existing chronic disease of the fallopian tubes is a necessary condition for tubal pregnancy to occur, is erroneous. I have seen cases of tubal pregnancy that gave no history of previous uterine disease. I well remember operating on a case of ruptured tubal pregnancy during shock and collapse, and the woman had a child under one year of age. She recovered and within a year from the time of operation gave birth in a normal way to a healthy child. She certainly had not suffered from a chronic uterine disease.

Shock in these cases is due to hemorrhage, and can you justify delay in operation for a reaction that will never come? Operate and secure the bleeding vessel at once.

In these extreme cases I have a method of sustaining the strength of the patient that gives pronounced and immediate results, and that is the submammary injection of sterile saline solution, starting it as soon as the anesthetic is begun and continuing it until the operation is completed. We are able in this way to put two quarts under the breasts during the time required to complete the operation, and the patient is taken from the table in a much better condition than when she went on. I firmly believe this procedure will save many cases that would otherwise die, and I cannot overstate its beneficial effects.

In reference to the route of operation in these cases, I believe one can do more thorough and complete work by the abdominal route in preference to the vaginal route; hence I do not agree with Dr Skeel that it is best to attempt to operate upon these cases by incision through the vagina into the culdesac.

One other essential point I wish to mention, and that is as soon as you have opened the abdominal cavity lose no time in putting a clamp on the broad ligament near the pelvic wall and another at the uterine cornu. By this procedure you will at once control the loss of blood, and then you can proceed to remove the ruptured tube without any further loss of the patient's vitality.

Dr Frank E. Bunts, Cleveland: The point which Dr Humiston has just called attention to is a very important one. The opening up of the culdesac is the one that impresses me most. It seems to me that if the symptoms present are sufficient to justify making incision into the culdesac, they are also sufficient to justify opening the abdomen. I remember operating on a case of supposed pelvic hematocele by the vaginal route, and when I opened the culdesac it started a terrible hemorrhage. I was obliged to open up the abdomen and succeeded in arresting hemorrhage and saving the patient. It proved to be a ruptured tubal pregnancy. Since then I have never resorted to that method, and I can hardly believe it is a desirable operation.

I had a case about two years ago that brought up a rather interesting point in regard to these cases of extrauterine pregnancy. I operated and removed the ruptured left tube and ovary. The right tube and ovary seemed perfectly normal, as far as I could judge. I allowed them to remain and within a year and a half the woman became pregnant again

in the right tube. This ruptured and another surgeon here in the city operated upon her. According to her statement he told her that I had made a great mistake in not removing the right tube at the time I operated upon her.

Dr Skeel draws attention to one of the difficulties of a differential diagnosis in extrauterine pregnancy, which I wish to emphasize also. In one case I operated upon about five weeks ago, there had been a rupture, but the diagnosis had not been made, at least not at first. Examination of the pelvis showed two masses present. The attendant thought there was a miscarriage and had cureted her. I saw her two weeks after the original rupture and she then had a temperature of 102°, and on vaginal examination I found masses on both sides of the pelvis. I was unable to say whether I had two suppurating tubes there as a result of curetment, or whether it was an extrauterine pregnancy. I was rather inclined to think I had two suppurating tubes. The operation simply revealed clots in the pelvis and a ruptured tube. The patient recovered.

Dr Rufus B. Hall, Cincinnati: I think the question which Dr Bunts brings before the Association is a very important one, and a very particular one to discuss. It brings up a point in the management of these cases in the duty of the operator, the responsibility of the operator to the patients, and the operator to their friends. These patients which become pregnant in healthy tubes. A woman becomes pregnant in a tube and comes to the operation impressed with the fact that she has not a healthy tube on the other side. Yet the surgeon may not be able with a naked eye to say the tube is diseased enough to justify its removal, but you know, broadly speaking, that the woman has not a healthy tube on the opposite side. If the tube is left they may become pregnant in the remaining tube after the operation and it is necessary to operate again. That brings up the question whether or not we are justified in removing the apparently healthy tube. I think in every case in which it could be discussed with the friends before operation, the question should be considered whether or not the surgeon should leave the other tube or whether he should remove both. We know they do become pregnant in healthy tubes, and we know that in a large number of these cases you have long-standing tubal diseases. They say no man would think of leaving the tubes diseased, but in those cases in which

there is doubt as to marked disease the responsibility rests very heavily upon the operator. Personally I am very much in doubt what to do sometimes in cases of this kind. The Doctor reports a case of a woman who had a tube remaining and had children afterward and got along all right. I reported a case some time ago right along these lines. It was that of a robust woman, and if there was a tube left, it should have been left in this case. She had no marked evidence of pelvic disease. She had a little leukorrhea, and I certainly could not detect any disease of this tube or ovary that would justify their removal. A short time afterward this woman became pregnant again in the second tube, and when I told her it would be necessary to operate upon her for the same condition as before she held me up to ridicule and wanted to know why I should crucify her twice. Fortunately for the patient and the Doctor she recovered after the second operation. This was a number of years ago. What shall I do with the opposite tube? Shall I leave that with the possibility of a second pregnancy in the tube, or shall I remove the tube? The answer has been one thing. Do not leave them in a condition in which there is any possible chance of tubal pregnancy taking place. Yet the doctor ought to put this before the patient.

Now I am going to stand by the essayist and his vaginal section. I believe, I know, he is right, and in the case he reports. He had a patient in which there was a doubt, a very great doubt. With the least possible danger to his patient he makes it positive. He changes the position and saves his patient's life. That is good surgery. He does not make a vaginal incision in every case to make the diagnosis certain.

I disagree with some of the speakers regarding tubal abortion. They say a tubal abortion usually gets well of its own accord. That is not my experience. They say that those are the cases which Nature cures. That is not true in any sense, but are the cases that die promptly. Cases that Nature cures are the cases that rupture, that are not very far advanced and rupture in the tube, where the tube is not all ruptured, and the placenta plugs the holes. Nature does cure some of them, but we cannot depend on Nature to cure them all.

Dr J. F. Fox, Toledo: I want to say a few words in regard to the incision that should be made, whether through

the abdomen or through the pelvis. Further, is it not a fact that we have two distinct directions in which this rupture takes place? We may have a rupture of the broad ligament and into the pelvis, and we have quite a number of cases that rupture intraperitoneally, that is, they would rupture out of the tube or upward into the abdominal cavity. It seems to me if we take into consideration the direction of the rupture our course is plain. If a tubal rupture goes into the pelvis, it seems to me that it would be good surgery to open that through the pelvis and drain it. I have had three cases. You cannot form a formula or fair rule to go by in this limited number of cases. I might say that usually the cases that rupture into the pelvis are not seen by the surgeon early. In these cases I simply open the culdesac, drain the blood out, usually there is very little danger of a secondary hemorrhage. Pack the wound with gauze after washing with salt solution, and the patients, as a rule, get well. In cases in which there is blood in the abdomen, and no pelvic enlargement, it is best to go right into the abdominal cavity. When you have rupture through the broad ligament into the peritoneal cavity the hemorrhage generally will not stop by itself. I believe with Dr Humiston that in cases in which there is bleeding from the torn blood-vessels until the patient is practically dead, or the hemorrhage is stopped by the surgeon's clamp or ligature, in these cases, of course, the incision should be made into the abdominal cavity. In a pelvic hemorrhage I don't think that the prolonged bleeding can take place. It will be stopped by the counterpressure, and you simply need to turn the blood clot out, when the patient will be on a good road to recovery.

I agree with the essayist that the operation in this class of cases should be done promptly. There is no condition I know of from which the patient will rally from shock so quickly as when the ligature or surgeon's clamp is applied and the hemorrhage stopped.

Dr F. F. Lawrence, M. D., Columbus: One thing occurs to my mind which I wish to emphasize, and that is in reference to leaving an apparently healthy tube when operating for the removal of tubal pregnancy. Should we always remove the tube or obliterate it? It has been my fortune, or misfortune, to see quite a number of these cases and to have had the unfortunate experience of a second tubal preg-

nancy in cases in which the tube had been left on the opposite side.

Some of you perhaps recall that only a few weeks ago I reported in the *Journal of the American Medical Association* one case in which a second tubal pregnancy occurred with an interval between that and the first of only 14 months. I also mentioned in that report two other cases which I had seen in which a second tubal pregnancy had occurred. Since that time I have had another upon whom I had operated four years ago for the removal of a right tubal pregnancy, and four weeks ago I had to operate for a left tubal pregnancy, although in that case I earnestly requested the patient and also the family physician that permission be given to remove both tubes; this was refused. I had, however, ligated the tube in two places which *did not prevent a second pregnancy*. I mention this case particularly to emphasize that occlusion of a tube by ligature will not always render a patient absolutely free from a second tubal pregnancy.

In the case referred to, the family Doctor and friends of the patient insisted that the left tube be not removed. The right tube in this patient was very large, being pregnant three months, although rupture had not yet taken place. The frightful risk of a ruptured tubal pregnancy should make us very careful in our practice.

In regard to a vaginal incision for diagnosis of doubtful cases, it seems to me with but very few exceptions this is bad surgery and fraught with too much unnecessary risk.

Dr Lester Keller, Ironton: I don't believe there is a man that has spoken that would let a case of tubal pregnancy die if he were present, but it seems to me the important thing to do is to clear up the diagnosis. The Doctor when called to a case of this kind should make the diagnosis early. It was my good fortune to operate upon seven cases last year in a small town; the last two in which the days of grace had been sinned away. I saw them when they were too low for operation. The other cases which I operated upon soon recovered, and I saw none of them until after the shock had occurred. In nearly all that I have seen it has been necessary to remove the tubes. I left the tube in in one case and now the woman is pregnant. If I thought the next case would give me as much trouble as has this one, I would say "take it out" every time. I think early diagnosis is the important question.

Dr R. E. Skeel, Cleveland, in closing: With regard to the etiology, the idea that ectopic gestation is due to disease of the tubes is the prevalent explanation, but gonorrhea, as we all know, is a bilateral tubal disease, and therefore if the patient becomes pregnant in one tube, and this tube is removed by operation, she must, if she is pregnant again, become pregnant through the other tube. Most cases the subject of gonorrheal tubes are sterile. Of the eight cases which I reported, in which the remaining tube was macroscopically normal, four have since that time been pregnant. Therefore the tubes were unquestionably healthy. Congenital displacements, torsions and bends in a tube have been assigned as causes of ectopic gestation. It is questionable after all whether it is disease of the tube by which the ovum is unable to pass, or disease of the ovum so that it cannot pass a healthy tube, which causes ectopic gestation. In the body of my paper I observed that we really did not know the cause of ectopic gestation, and that is still my position.

Concerning the diagnosis, I would say that it is unfortunate for this discussion that Dr Humiston's cases have all been cases of free intraabdominal hemorrhage, so severe that the patients were in collapse and the diagnosis in no doubt. Patients do, however, survive the shock of the first hemorrhage, and some of them have repeated small hemorrhages, so that a mass forms in the pelvis. The question of diagnosis then is a very difficult one as between this form of ectopic gestation and attempted or actual criminal abortion with infection of the pelvic tissues. It is in this class of cases in which the diagnosis is in doubt, and not the frank free hemorrhage, in which no one could be mistaken, that the posterior vaginal incision is of adantage, not as method of treatment, but as a method of diagnosis. No man would choose to open the abdomen in the midst of a pelvic infection due to an induced abortion in cases in which it was possible to open the posterior culdesac and make drainage without the possibility of contaminating the peritoneal cavity. Then, if one is mistaken in his diagnosis, and the case be one of pelvic infection and not ectopic gestation, the simplest and safest method of treatment can be at once adopted, *i. e.*, drainage through the vagina.

While it is possible that a tube may rupture into the broad ligament rather than into the free peritoneal cavity, I

have never seen such a case, and I can conceive of the possibility of the formation of an hematocele without a ruptured tube. It is not necessary for an artery to rupture to produce an hematocele, but the varicose veins of the pampiniform plexus may rupture and may produce an hematocele of considerable size: so that all hematoceles are not necessarily results of ectopic gestation.

The trend of opinion in this discussion seems to have been that if one tube is removed for ectopic gestation, the other tube should be removed whether apparently diseased or not. I am sure that I am unable to say which of these two methods of treatment, the removal of the ruptured tube alone, or removal of both tubes, is correct. I should feel, however, from my experiences, that I would have no more right to remove an apparently healthy tube from the other side to prevent a possible ectopic gestation than I would to remove the tubes from any healthy woman whose abdomen might be opened, or because there might be ectopic gestation in the future.

Conservatism in Pelvic Surgery

By Hunter Robb, M. D., Cleveland

Professor of Gynecology, Western Reserve University, and Visiting Gynecologist to the Lakeside Hospital

A thoughtful conservatism in operative procedures, when dealing with pathologic conditions of the female organs of generation, has fortunately become the rule in the majority of surgical clinics. And more particularly is this likely to be the practice where the surgeon in charge has kept in touch with the progress that has been made from this standpoint, and from his own experience, and that of others, has learned to appreciate the advantages of conservative procedures in the treatment of pelvic inflammatory disease. There still remain, however, operators who believe it to be their duty to resort to extreme measures when dealing with pathologic conditions of the tubes and ovaries, although the same men often favor more conservative procedures when they encounter general surgical abnormalities. Now, with few exceptions, the so-called cystic or cirrhotic ovary is

still capable of performing its functions, and when the organ is bound down by adhesions, the symptoms are apt to be due mainly to their presence. Hence, in the restricted sense of the term, the condition of such organs is not pathologic and when they have been removed under these circumstances they seldom, if ever, show any evidences of inflammation even upon microscopic examination.

But even when the ovaries or tubes have undergone actual inflammatory changes, or where they are occupied by tumor formations, or are bound down by adhesions so that their functions are interfered with and the necessity for operative procedures becomes imperative, we still have to decide how far we ought to go and how we can get the best results for the patient not only immediately but later on. After an experience of more than five years in the application of conservative measures in various forms of pelvic abnormalities, we have been able to thoroughly convince ourselves of the great advantages that may be obtained by preserving, as far as possible, the integrity of the pelvic organs. It is true that in a small percentage of cases, after such a line of treatment has been followed, the patient will still have to undergo a second operation before she can be completely relieved of her discomfort, and it is also possible that in a few instances, by the introduction of infection under these circumstances, her condition may be rendered even worse. Such cases are exceptional, however, in our experience. Before choosing the more conservative operative procedure, we always make it the rule to carefully explain to the patient, or to her friends, that such measures will be carried out if in our judgment at the time of the operation they seem to be advisable. But we further state, that even though we remove what seems to be the inflammatory area, it may later become necessary to institute a second operation, before relief is obtained. In the great majority of instances, the patients are perfectly willing to take a good many chances if there is a reasonable prospect that the conservation of

the pelvic organs will be compatible with future health and comfort, and from actual observation we have found that it does not become necessary to perform a second operation in more than from three to five percent of all such cases. If an ovary or a portion of an ovary can be saved, before the normal menopause has begun, or even during the time in which the patient is experiencing these changes, we have found that not only the immediate convalescence, but also the subsequent condition of the patient is in every way more satisfactory. Anyone that has cared for patients that have had their ovaries removed (even though diseased) can testify to the fact that many of them suffer more or less acutely for varying periods of time following the operation, in some instances as long as five years. And unfortunately during this time the morphin or some other drug habit may be formed in endeavors to relieve the distress. The prevention of the artificial menopause is the most important reason for not removing the ovaries whenever this is possible. The question of possible pregnancy following conservative measures is in our opinion only of secondary importance, as in the majority of these cases the patients are in an unhealthy condition for the bringing of a child into the world. This criticism, of course, does not usually apply to those cases in which a tumor is present, implicating only one ovary. In cases in which the question of pregnancy is to be considered, one has to deal with the condition of the fallopian tubes, as well as that of the ovaries. The various methods to be employed in these conservative operative measures when dealing with the tubes and ovaries are well known to everyone and a description of them would be merely a tiresome repetition. I would say, however, that in the light of our experience it is a wiser procedure to remove the fallopian tube whenever a pyosalpinx exists, *i. e.*, where there are macroscopic evidences of pus. When, however, the ovary is involved in an abscess formation, the same radical treatment is not always indicated, as the abscess in most instances does not involve all of the ovarian stroma. Moreover, micro-

scopic examination of many of these ovaries will show that the abscess is walled off, and the ovarian stroma beneath is frequently invaded only to a slight extent. In such instances the abscess may be excised and the line of incision be brought together with a fine silk or catgut suture. I shall now give a brief analysis of the work in this line carried out in the Gynecological Department of the Lakeside Hospital during the past five years. I wish to acknowledge the valuable assistance of Dr Howard Dittrick, the Resident Gynecologist, and Dr Wm. T. Abbott, the First Assistant Gynecological Interne to the Lakeside Hospital, in the preparation of the analytic tables. In all the cases that we have considered the lateral structures showed microscopically *marked* evidences of inflammatory disease, and there were adhesions which bound down the structures. We have only included in this analysis those cases in which we were able to carry out conservative measures, and not those in which we were obliged, on account of the technical difficulties of the operation, to leave the lateral structures in on one or both sides, although removal was indicated.

ANALYSIS OF CASES

Total number 237.

Age: The oldest patient was 52, the youngest 17 years of age; average age 28.12 years. Four were 17; 6 were 18; 8 were 19; 8 were 20; 12 were 21; 12 were 22; 20 were 23; 19 were 24; 14 were 25; 9 were 26; 8 were 27; 18 were 28; 7 were 29; 14 were 30; 3 were 31; 6 were 32; 10 were 33; 4 were 34; 7 were 35; 2 were 36; 3 were 37; 6 were 38; 4 were 39; 5 were 40; 3 were 41; 3 were 42; 2 were 44; 1 was 45; 3 were 46; 2 were 47; 1 was 48; 1 was 49; 1 was 50; 2 were 52. The majority of the patients were between 17 and 30 years of age.

Menstrual History: The menstrual history was abnormal in 169 and normal in 68 cases. The menopause had taken place in one. The symptoms presented in the abnormal cases in most instances were those of dysmenorrhea, menorrhagia, prolonged and irregular flow.

Leukorrhea: 176 patients gave a history of a leukorrheal discharge. Of these patients 124 were married, 38 were single, and 14 widowed.

Married Life: 165 were married; 52 were single; 20 were widows. Longest time married 28 years; shortest time married three months. Of the 165 married 115 had borne children. The total number of children borne by the 115 patients was 271, the average being 1.12%. The greatest number of children borne by one patient was 11; the next greatest number was 9; still-born children 2; twins 1. Women having borne 1 child, 51; 2 children, 21; 3 children, 12; 4 children, 13; 5 children, 4; 6 children, 5; 7 children, 2; 9 children, 2; 11 children, 1.

A history of infection following labor was recorded in 40 cases. Instrumental delivery was followed by infection in 13 cases. The total number in which there was a history of infection following labor, 53.

Miscarriages: Number of patients having had miscarriages 103; number of miscarriages 172; married, 83; single, 10; widowed, 10; abortions or miscarriages had been induced in 52 cases; in the married patients, 34; in single patients, 10; in widows, 8; patients having had 1 miscarriage, 65; 2 miscarriages, 22; 3 miscarriages, 13; 4 miscarriages, 1; 5 miscarriages, 1; 6 miscarriages, 1; 7 miscarriages, 1. Infection following a miscarriage occurred in 42.

Gonorrheal Infection: In 51 patients there was a history of gonorrheal infection; positive in 32; probable in 19. Of these 28 were married; 19 single; and 4 widowed. Among the married the history was positive in 16, and probable in 11, and in 1 was complicated with syphilis. Among the single the history was positive in 15, and probable in 4 cases. Among the widows, positive in 1 case, and probable in 3. A positive history of a specific infection is generally difficult to obtain and unless the infection can be surely proved, we are not justified in making positive deductions from this standpoint. It will be seen from a study of the cases of labors and miscarriages, that infection in these instances plays a very important part in the causation of inflammatory diseases of the tubes and ovaries. Thus there were 53 cases of infection following labor, and 42 following miscarriage, in all 95 cases.

Bowels: In 73 cases there was a history of constipation; 47 of the patients were married; 14 were single; 12 widowed.

Micturition: There was some complaint with this function in 124 cases; 90 of the patients were married; 23 single; 11 widowed.

The general condition was good in 138 cases, and in 81 fair, and poor in 17.

The uterus was adherent in 121 cases; 86 of the patients were married; 29 single; 6 widowed.

The bowels were adherent in 165 of the cases; 110 of the patients were married; 42 were single; 13 were widowed.

The vermiform appendix was removed in 113; married 80; single 23; widowed 10. For the following reasons: In 56 married patients it was adherent; in 14 flexed; in 1 occluded; in 9 hypertrophied. Single: Adherent 18; flexed 3; occluded 1; concretions 0; hypertrophied 1. Widows: Adherent 8; occluded 1; hypertrophied 1.

It was adherent and not removed in two cases on account of an extreme condition of shock after removal of the pelvic structures. One of the patients was married, the other single. Number in which appendix was adherent 82; flexed 17; occluded 3; hypertrophied 11; total 113.

Structures Saved: Ovaries—Right 93; left 76; both (47 times) or 94 ovaries. Right (partial) 17; left (partial) 17; both (partial) 3; both ovaries 17 times with tubes, or 34; total 334 ovaries. This number was saved in 237 cases or a little over one ovary and a third to each patient.

Structures Saved: Tubes—Right 17; left 25; both 25 times, 50; right (partial) 15; left (partial) 11; both (partial) 5 times, or 10; total 128 in 237 cases or a little more than one tube to each patient.

Structures Saved in the pus cases: Pus was met with in 64 cases out of 237 or in 26.62%. They were divided as follows: Married 40; single 18; widow 6; total 64.

The pus was found as follows:

Double Pyosalpinx: Married 22; single 5; widows 3 times; total 30 times.

Single Pyosalpinx: Married 7; single 5; widows 1 time; total 13.

Tuboovarian Abscess with Pyosalpinx: Married 6; single 1; widow 0 times; total 7 times.

Tuboovarian Abscess Double: Married 0; single 8; widow 0; total 8.

Tuboovarian Abscess Single: Married 1; single 2; widow 1; total 4.

Ovarian Abscess Double: Married 0; single 1; widow 1; total 2.

Structures Saved in pus cases: Ovaries—Right 27; left 15; both (12 times) or 24 ovaries; right (partial) 4; left (partial) 2; total 73. Tubes—Right 5; left 2; right (partial) 2; both (partial) 2; total 11. 73 ovaries were saved in 64 of the pus cases, or about one and a fifth ovary to each patient. In 12 cases both ovaries were saved; 11 tubes were saved or 1 to about every 5½ patients.

In these cases the following organisms were found: Gonococcus 6 times; streptococcus pyogenes 4 times, 1 doubtful; staphylococcus pyogenes aureus 3 times; staphylococcus pyogenes albus 2 times; bacilli coli communis 2 times; bacilli mucosus capsulatus 1; cocci (no growths) 3 times. Total 21 in all or 1/3 of the cases.

In the pus cases the abdominal wound became infected 4 times or 6.34%. From the infected abdominal wounds in the pus cases the following microorganisms were found: streptococci 1; bacilli coli communis 1; staphylococcus pyogenes aureus 1; staphylococcus pyogenes albus 1; B. mucosus capsulatus 1; making a total of 5.

Microorganisms found in abdominal wounds other than pus cases: Bacillus coli communis twice; staphylococcus pyogenes albus twice; cocci and bacilli on coverslip, no growth once; making a total of 5.

The leukocyte count in the pus cases: highest, 36,000; lowest, 10,000; average count, 21,615.

Drainage was employed in the pus cases as follows: Abdominal alone, none; vaginal, 13 times; abdominovaginal, 2; 15 times in all, or 23.42% of all pus cases; for the abdominal route 3%.

Drainage: Drainage was carried out 21 times in 237 cases or in 8.86% of the total number of cases. Once by the abdomen alone; twice by the abdomen and vagina combined; 18 times by the vagina alone. The convalescence was interrupted by the following conditions: by bronchitis in 4 cases; pneumonia in 1; pleurisy in 3; plebitis in 1; abdominal fecal fistula in 1; postoperative mania in 1; suppuration of abdominal wound 20 times. Total number interrupted 31.

In those cases interrupted by infection of the abdominal wound (8 of which were in the pus cases) 19 of the infections were slight and one marked in amount. Total number of abdominal wounds infected 8.43%.

Number of cases requiring a secondary abdominal operation for the relief of symptoms, 7. Number of cases under observation on account of pelvic discomfort, 8. In 7 of these cases the symptoms of which they complained disappeared after a year's time; 1 case is still complaining. Deaths in the pus cases 2, or 3.1%. Deaths in whole number of cases (237) 4, or 1.66%.

Case No. 1: Among the pus cases the diplococcus pneumonia was found in the secretion in the peritoneal cavity together with the bacillus mucosus capsulatus and the bacillus coli communis. In the second case the patient also died from the effects of a pelvic peritonitis, and autopsy was not allowed.

The two remaining cases were in the nonsupporting class. In one there was an ectopic gestation which involved the right tube. On the eleventh day following the operation she developed an acute obstruction of the bowels. The temperature and pulse were practically normal. The abdomen was reopened, and the obstruction relieved, but she succumbed from shock one hour following the operation. In the second case the disease of the lateral structures was complicated by an adherent and much thickened and contracted gall-bladder, which contained three good-sized gallstones. The opening made into the gall-bladder was difficult to close. The patient developed a localized peritonitis, which resulted fatally five days after the operation.

Retroversion

By J. C. Tritch, M. D., Findlay

When we are brought face to face with the fact that from 25 to 30% of the women of this country are the unenvied possessors of retroverted or retroflexed uteri, and from 60 to 70% of these suffer from the consequences of such deviations from the normal, a few words may not be out of place

in calling attention to the amelioration, prophylaxis and cure of this constantly recruiting army of sufferers.

Many of you will say that you have patients afflicted in this manner who apparently are well and give few if any symptoms; this I grant is true, my own observations will bear this out; but on the other hand, a great many cases of chronic invalidism can be justly attributed to these malpositions with the accompanying complications. The uterus should be regarded as an organ suspended by its ligaments (guy ropes, if you please), each one of which has some slack, thereby permitting a certain amount of mobility in various directions, and accommodating itself to temporary deviations such as may be caused by a distended bladder or rectum.

When from any cause (chiefly subinvolution) we have an added weight to the normal uterus, this must, if long continued, result in an overstretching of some of its ligaments.

This condition is most likely to occur in the lying-in, either following a labor at term, or more frequently abortion. Usually the directions left by the obstetrician of today when taking his leave after a tedious or difficult parturition convey to the patient the idea that she is to lay very quiet flat on her back for two or three days, at least, and thereby possibly escape the dire calamity of a hemorrhage. Suppose, as very frequently happens, on the second or third day thereafter the woman has some fever which developments prove to have been not only metritis but localized peritonitis. In what condition is that woman a month or so thereafter? In the great majority of cases she will get out of bed with a retroposed adherent uterus.

It is not my intention to go on and discuss the various symptoms and sufferings incident to the tardy convalescence of these cases, for I take it that it is unnecessary, for you have no doubt all had similar cases to my own, and still have them. These are the cases that haunt the physicians' offices, walking ghosts that will not down. Mothers often of only one child, but often sufferers from innumerable miscarriages, each one of which only adds to

her misfortune. Sufferers from these conditions have usually more or less continuous backache, difficult defecation, pelvic tenesmus and dysuria. Persistent or oft-repeated nervous headaches prevail, pains in lower limbs, and in time a condition of anemia and general neurasthenia unfits the woman for her duties as a wife and mother. What can we do for these patients? Most all of them are amenable to treatment in some form. The first step in the treatment of a case of retroposed uterus is to determine the condition of its surroundings and ascertain, first, if the appendages are diseased; second, if the uterus is adherent; third, note the condition of the vaginal walls, the perineum and cervix; fourth, determine also particularly the mobility of the cervix even if the fundus is adherent; this to take cognizance of the amount of relaxation of the uterosacral ligaments, for aside from diseased conditions it is relaxation of these together with the round ligaments that stamp the case as one of retrodeviation.

Treatment: If the uterus is retroverted and not adherent, a great deal can be done for the patient to make her comfortable, by giving her proper instruction as to the occasional assumption on her part of the knee-chest position and the benefits of a self-placed glycerin lamb's-wool tampon before changing her position. I believe this to be better than the use of pessaries.

Should such a woman become pregnant, she should be impressed with the necessity of having the malposition corrected and a proper one maintained for at least five months, and following the delivery either at term or otherwise, the patient should not be allowed to rest upon her back at all while in bed. It has been my method to favor as nearly as possible a prone position, even so far as attending to Nature's calls, in which case allow the patient to get upon her knees and elbows on the bed, passing the vessel between the separated thighs and in all her movements never losing sight of the fact that she must not put herself in such a position as will allow her uterus to drop backward.

Cases complicated with adhesions posteriorly but unassociated with adnexal complications can often be cured by bimanual massage continued over a period of three to six weeks. Here is the one place that a suitable pessary, worn for several weeks after the final liberation of the uterus, can be of a great deal of benefit.

When we come to the treatment of the more serious forms we usually must have recourse to some of the operative procedures that have been devised by various eminent gynecologists. The indications usually given for the Alexander operation or some of its modifications will hardly cover the more complicated cases. In fact, I believe the Alexander operation to be applicable to those cases without many symptoms, but who, knowing that they have a retrodeviation, will submit to the operation for the sake of having themselves pronounced well.

An abdominal section not only gives an accurate view and realization of things as they actually exist, but also at the same time allows such operative procedures to be carried out (as demonstrated by Wylie, Kelly, Gilliam and others) as have been found to give results that are satisfactory and conducive to a radical cure.

To me the plan that has been most satisfactory in every way, save only in those cases in which serious involvment of the appendix is likely to be met with, is the anterior vaginal route. Grandin and others do not look upon the method with much favor, but I find that many patients will avail themselves of operative treatment when it can be done without an abdominal incision.

The round ligaments can be readily shortened through this incision after the method of Wylie, adhesions can be broken up, diseased ovaries and tubes removed when necessary, permeability of tubes can be determined; in fact, all can be done that is necessary as to the conservative or radical treatment of these cases.

A posterior incision at the same time will enable one to take up the slack in the uterosacral ligaments and no

operation for retrodeviation can be regarded as a positive success that does not make such provision.

Half the time spent in convalescence should certainly be one good point in favor of vaginal section. An avoidance of abdominal incision and its resultant scar, which are objectionable to so many women, should be a second; the reduction of shock to a minimum should constitute a third, and a notable better percentage of radical cures and a minimized risk for the patient are some other things which should be finally considered when these cases come into our hands.

Pregnancy Complicated by Fibroid

By Charles Lybrand Bonifield, M. D., Cincinnati

Fortunately fibroid tumors predispose to sterility. The nearer the tumor is to the endometrium the less apt is conception to occur, for it is largely by the endometritis it produced that conception is prevented, though the coincident diseases of the ovaries so often found produce sterility, as may malposition and deviation of the uterus. Pregnancy complicated by fibroids is, therefore, comparatively rare, and the following cases which have come under the observation of the writer may be sufficiently interesting to receive the attention of the Association for a few minutes.

Case I: The patient was seen in the summer of 1886 with Dr G., of Norwood. I was asked to see this case 48 hours after delivery because the Doctor believed he had an inversion of the uterus to deal with. I agreed with his diagnosis and made an effort at reposition, which being unsuccessful, an anesthetic was given. I then recognized that it was a fibroid polypi which had been expelled from the uterus and vagina. The pedicle was about the size of an index finger and was attached a short distance above the internal os. I rotated the tumor to twist the pedicle and then severed it with a pair of scissors. There was no hemorrhage and the patient made a prompt recovery.

Case II: The patient was seen with Dr E. W. Mitchell to whom I am indebted for the following notes of the case: Mrs C. R., mulatto, age 27, gave a negative family and per-

sonal history up to time of coming under observation. On June 8, 1889, she came for examination. She had felt fetal movements about 10 days before, and had suffered rather severely from nausea and vomiting. For nearly four months she had pain and tenderness in the left inguinal region, with backache and "bearing down" pain. Bimanual palpation revealed two masses in the pelvis, the one to the patient's right, having an outline and consistency of a pregnant uterus, projected above the os pubis, and could scarcely be palpated *per vaginam;* the mass to the left nearly filled the pelvic basin; this mass was firmer and more irregular than the other.

A diagnosis of pregnancy complicated by fibroid was made. All efforts to displace the tumor and carry it above the pelvic brim were unavailing, and on June 12, 1889, assisted by Dr C. L. Bonifield and Dr W. D. Porter, I made a section at her home. A pregnant uterus was found pushed up and to the right, the fibroid lying to the left below the pelvic brim. At the left of the sacroiliac joint was an exostosis the size of a walnut materially narrowing the pelvic brim. The fibroid was attached to posterolateral wall of the uterus by a pedicle one and one-half inches long and one inch thick. The pedicle was ligated, and the tumor was removed. The abdomen was closed without drainage. The patient made a rapid and uncomplicated recovery. At seven and one-half months labor was induced, and delivery by turning was accomplished with great difficulty. The child was still born. The patient is now living, but has never again conceived.

Case III: The patient was the wife of a physician living in southern Indiana. She had been pregnant and miscarried at about the fourth month. A large submucous fibroid, which she had, had become infected. When I saw her her temperature was 105½° and the pulse was 140. I did not think she would survive a hysterectomy. The tumor was, therefore, removed by morcellment, but the patient succumbed in a few minutes after being returned to bed.

Case IV: Mrs J., colored, entered Christ's Hospital on May 13, 1900, on the obstetric service, under the care of Dr L. S. Colter. She was five months pregnant and was having severe labor pains, but the head was unable to engage, and Dr Colter, seeing that delivery could not be effected, asked me to see the case. We decided at once on surgical

intervention and I opened the abdomen and did a hysterectomy. The patient left the Hospital well June 14.

Case V: On the night of October 25, 1902, I was summoned to see Mrs T. D., in consultation with Drs Richards and Schoolfield. I reached the bedside about 2 a. m., and found the patient had been in labor six or eight hours. She was 32 years old, the mother of two children, the youngest of which was 14 months of age. She had been delivered of this child in New York, and, while the labor was tedious, lasting 26 hours, on account of an early rupture of the membranes, the use of instruments was not necessary, and the physician in attendance made no mention of anything abnormal to the patient or her family.

When Dr Richards was called at the beginning of labor he found a large fibroid filling the hollow of the sacrum and obstructing the pelvic inlet to such an extent that he believed delivery *per vias naturales* to be impossible. He asked Dr C. B. Schoolfield to see her in consultation, who verified the diagnosis and expressed the same opinion as to the possibility of delivery. I was asked to see the case for the purpose of doing a cesarean section, if my opinion coincided with theirs. We placed the patient under an anesthetic to make a more careful examination and ascertain if it were possible to lift the tumor up out of the pelvis. We found this could not be done and recommended that the patient be sent at once to the Hospital and operated upon as soon as she could be made ready. The patient objected to going to the Hospital and after much time spent in persuasion Dr Richards and his two consultants declared that unless she would go to the Hospital and submit to the necessary surgery they could not take charge of the case. This had the desired effect and she was removed to Speers' Hospital, first having been given a full dose of morphine hypodermically to stop labor pains. By the time everything was in readiness it was so near dawn that we decided to wait for daylight to operate. The operation was performed about 7 a. m., the patient having been in labor about 12 hours, the pains having been strong and the os having been pretty well dilated, but the head not even having begun to enter the pelvis. The usual free incision was made in the abdominal wall, and warm gauze sponges were packed around the uterus. Free incision was made in the anterior wall of the uterus and the child lifted out. The placenta and membranes were delivered without difficulty

and the uterine incision closed as rapidly as possible with interrupted sutures of catgut including all of the wall of the uterus except the mucous membrane. A second row of sutures of the same material was inserted, including only the peritoneum. The abdominal incision was closed in my usual way, three sutures of catgut in the deeper structures, and silk worm gut in the skin. The patient did admirably well. The child was made to breathe with little difficulty and both it and the mother are doing well at the present time. No effort was made to remove the fibroid tumor because it seemed that it could not be done by any other procedure than a panhysterectomy. This I regarded as an exceedingly dangerous operation under the circumstances, and thought it wise to wait and see what effect involution might have on the tumor, hoping a myomectomy might then be possible. The patient reentered the Hospital and a panhysterectomy was done June 7, 1903. The fibroid had grown rapidly since the former operation and has so filled the pelvis that she was unable to empty her bladder. After the abdomen was opened it was lifted out of the pelvis with difficulty. Gauze drainage, brought into the vagina through a hole made for the purpose at the bottom of the cavity left by the tumor, was used to control oozing. The recovery was prompt.

Case VI: Mrs R. was brought to my office by her family physician Dr Loomis, of Independence, Ky., who told me that he believed she was pregnant and that she had a large tumor. Upon examination I found a tumor filling the pelvis and extending above the umbilicus. The patient's left leg was swollen to twice the size of the right. I was unable to reach the cervix and could form no opinion as to the probability of pregnancy. Dr Loomis and the patient both said the tumor had almost doubled itself in size in four weeks. She entered the Good Samaritan Hospital on February 8, and on February 10, I did a supravaginal hysterectomy. She was three and a half or four months pregnant. The tumor had developed in the left broad ligament and far down behind the uterus and vagina. In lifting it out of the pelvis a large hole was torn in the rectum. This was repaired with chromicized catgut. The iliac vessels were uncovered for considerable distance but fortunately were not torn. The abdomen was closed without drainage. The recovery was uneventful.

These cases illustrate the surgical measures that may be required in dealing with the condition under consideration, but it is not every woman who has a fibroid and becomes pregnant that requires surgical treatment, during pregnancy or at the time of labor. If the fibroid is interstitial or subperitoneal, and is so situated as to not precede the head into the pelvis, the treatment can safely be expectant and if no urgent reasons for interference manifest themselves its removal may be delayed until after the puerperium. It will often be found that involution of the uterus is accompanied by marked diminution in the size of the tumor. A tumor that during the early months of pregnancy is down in the pelvis, where it seems certain it will cause trouble at the time of labor, may arise out of the pelvis as the uterus enlarges, and not be at all in the way.

When the fibroid is intraligamentary it cannot get out of the way and the amount of trouble to which it will give rise can be accurately estimated by its size. If it does not seriously lessen the diameters of an ample pelvis the rational treatment is the induction of premature labor. If it is evidently impossible to deliver a viable child through the pelvis and, if pressure symptoms do not become troublesome, pregnancy may be allowed to go to term and be dealt with by cesarean section or the Porro operation. Pressure symptoms necessitating treatment will require a myomectomy or hysterectomy owing to the attachment of the tumor and the judgment and experience of the operator. One will seldom succeed in doing a myomectomy is such a case without abortion following, but if there are not numerous other fibroids present it should still be the operation of choice, for a chance is thus given for future pregnancies. It is said that trauma inflicted on the posterior wall of the uterus is less apt to produce abortion than if it be on the lateral or anterior wall; an important fact to remember when deciding as to the advisability of a myomectomy. Abortion is, I think, the rule with women becoming pregnant while having sub-

mucous fibroid. Infection is especially dangerous in such cases and the medical attendant should exercise the utmost care to prevent it.

In conclusion I would make a plea for conservatism in dealing with pregnancy complicated by fibroid. The interests of the mother are always paramount but those of the child are not to be lightly considered.

When the child is carried to term the danger of hemorrhage is very considerable because the uterus may not be able to contract at the site of the placenta. The blood-supply of the tumor may be so interfered with by the expulsive efforts of the uterus that gangrene ensues, and death from sepsis may result.

The Need of More Careful Work in Obstetrics

By F. W. Lane, M. D., Cambridge

In presenting this paper I wish to call attention to a few points which I think have been neglected far more than matters of like importance in other fields. We have numerous text-books covering ably the field of obstetrics, but something more than text-books is needed to impress the average practitioner. Once telling is not sufficient, but facts must be repeatedly presented and emphasized to make a lasting impression. This is distinctly an age of preventive medicine. There has been a constantly increasing struggle and as constantly increasing success in prophylaxis of many of the diseases. There is a very marked belief in this generation that one of the best methods of prophylaxis is the cultivation of a sound physical organism, not only for the benefit of the individual himself, but for the production of stronger offspring who are more able to resist deleterious influences. It seems to me that in carrying out this modern plan, less importance is attached by the average physician to the preservation of the health of the pregnant and parturient woman than to any other phase. One cannot expect a weak, nervous woman, who is

barely able to drag out her own existence, to furnish nourishment of good enough quality to properly nourish her infant and bring it to its highest possible physical and mental development. The large proportion of previously healthy women who emerge from the puerperal period partial or complete physical wrecks, bears testimony of the neglect from which they suffer. I know of no statistics on the subject, but my own observation is that the number is appallingly large when it is remembered that most of such results are preventable. The chief function of women is the reproduction of the human race. The first command given the human race was "Be fruitful and multiply," and almost the whole burden of carrying out this command was laid on woman. She was given for this work a set of organs which is weaker anatomically than any other in the body. The uterus is situated at the upper part of the patulous vaginal canal with a part of the weight of the abdominal viscera resting on it. This weight is increased when the abdominal muscles contract strongly. The suspensory ligaments of the uterus, the round, broad and uterosacral ligaments are totally inadequate to stand this strain. They are assisted, however, by the fact that normally the anteversion of the uterus throws a large part of the weight on the bladder and pubes and backward on the posterior wall of the vagina. The uterus is not very firmly held in this position, and if it assumes a vertical or slightly retroverted position, the line of force more nearly coincides with the direction of the vaginal canal, thus preventing to a large extent the supporting power of the posterior vaginal wall. If the integrity of the posterior vaginal wall is impaired, this support is weakened.

With the removal of this support the weight comes almost altogether on the uterine ligaments, which, except in exceptional cases, are totally inadequate to the task. Another point of extreme weakness is the fact that the peritoneal cavity, whose walls are so delicate and so intol-

ıt of septic material, has a direct external communica-

tion through the fallopian tubes, uterus, and vagina. These naturally weak parts are often weakened more by improper position of the body, poorly-fitting corsets, both of which may produce displacements, and lack of care at the menstrual periods, producing congestion and chronic inflammation.

When pregnancy occurs the uterus is enormously enlarged in size and weight, and the ligaments must lengthen in order to accommodate this growth. During the normal puerperal period the uterus decreases in size, almost but not entirely to its normal size, and the ligaments become shorter. These changes, however, never continue to the point of entirely restoring original conditions. During normal labor the vaginal walls must stretch to several times their original size, and while subsequent contraction occurs there is never a complete return to the original size and tonicity. Thus it will be seen that even under the best of conditions woman is exposed to many risks of injury to the strength of her reproductive organs. It is almost the exception in these days for a woman to go through pregnancy and labor in a thoroughly normal way. She is exposed to the dangers of kidney lesions with the awful manifestations of eclampsia; of extrauterine gestation with the risk that involves even when recognized, and the almost certain disaster if the condition is not recognized; of miscarriage with its added risks; of placenta previa and premature detachment of the placenta with the dangerous hemorrhages which they produce; of the various unfavorable positions of the child; of postpartum hemorrhage; of infections; of lacerations and of subinvolutions. That physician is not doing his duty to his patient, who does not ask for a sample of her urine for examination. It is better to make a thousand negative tests of the urine, than to take the chance of missing the one which shows evidence of impending eclampsia. It is the custom among the majority of the laity to think that the obstetrician's services are not required until labor begins. They must be taught the wisdom of putting

the pregnant woman in the obstetrician's care early in order that abnormalities may be detected in time to correct them. The physician who is not able to intelligently handle a case of placenta previa and give his patient a chance for recovery is not competent to practice obstetrics.

In the management of cases of miscarriage and labor too much stress cannot be laid on the importance of careful asepsis. It is astonishing the number of physicians—not alone among the older men, but among those out of medical school a very few years—who attend these cases without any antiseptic whatever, and who do not even wash their hands until they have been soiled by the vaginal examination. The flow of the natural discharges tends to carry away any infectious material and the normal cell resistance enables the poor woman to overcome some infection which reaches the uterine cavity. Even with these efforts of nature there are many hundreds of women whose lives are given up a sacrifice to the ignorance or carelessness of physicians. There are many hundreds more who escape death only to remain invalids the rest of their lives.

It is true there may be some cases of septic infection when great care has been exercised, but that is no excuse for omitting the effort to prevent infection.

One might as well refuse to try to cure any disease on the plea that many will fail to recover in spite of the most careful treatment. Every patient should be carefully examined immediately after labor to determine if there have been any lacerations. If any are found they should be repaired at once. This examination, as all obstetric procedures, should be carried out under the most careful aseptic precautions.

The examining finger may often be educated so that a laceration can be detected by touch. If there is any doubt, one should not hesitate to make a visual examination.

It is very easy to overlook moderate lacerations if one is not on the alert when the perineum is on its greatest strain, and does not hunt for them afterward. The apparent ease with which they can be overlooked is shown by the number of men who tell of wide experience and who say they have had almost no lacerations in their practice.

The cervical lacerations will nearly always require a careful visual examination for their detection.

I want to reemphasize the fact that these examinations must be made only under careful aseptic precautions.

The cervical lacerations, through the irritation of the cicatricial tissue which usually forms as they heal, produce an inflammation of the uterus with an increase of weight and tendency to displacements. If to this is added a perineal laceration, the normal support of the posterior vaginal wall is removed in proportion to the extent of the injury, and the displacement of the uterus is thereby increased and even added to by the ultimate prolapse of one or both vaginal walls.

The importance of the immediate repair of these lacerations has been impressed on me by the fact that I have often encountered them in my own practice, and with immediate repair they have never left any bad results, and also by the fact that I have restored a number of women from invalidism to good health by performing an operation which removed all irritating cicatricial tissue, and restored the normal anatomic relations of the parts.

It must be said, very much to the discredit of the profession, that a very large part of the gynecologist's work is the correction of the neglect and mistakes of the general practitioner in obstetrics. As the last thing before discharging an obstetric patient, there should be, if possible, an examination to determine if involution has progressed to the proper stage. I know it is hard to induce the average patient to realize the importance of this, but if physicians would all insist on it, the laity would finally come to expect and insist on it.

It has been impossible in so short a paper to even approximate an adequate presentation of this subject, but I wish to go on record as insisting upon the great necessity of more care in regard to strict asepsis and immediate repair of lacerations, however small, because I think that these two phases of obstetrics are more woefully neglected by the majority of physicians than any other department of medicine.

CHAPTER VII—UNCLASSIFIED

Fifty Years in Medicine

By John D. West, M. D., Hopedale

In considering the growth of medical knowledge during the half century covered by my own term of active practice, it comes almost as a shock to remember that the history of the art of medicine, properly so-called, and the advancement of pathologic science had its beginning only two centuries ago. Humoral pathology was not dismissed until late in the eighteenth century, even early in the nineteenth. It can scarcely be said to have been seriously questioned until the earlier years of the seventeenth.

Up to 2,500 years ago there was no real medical history. For a thousand years before that it was largely traditional, and the art itself was vague, mystical, astrologic, or alchemic.

From Hippocrates, in the fifth century before Christ, we have the first rudiments of medicine as an art by itself, the system of Pythagoras as expounded in Greater Greece being more distinctively philosophic than pathologic. The Babylonians had no art of medicine; and in Egypt medicine was associated with the priestly office, as it afterward was in Greece. The one aspect of the old Egyptian practice that has come down to us and is still presented, was specialization, and this was carried farther than we would dare go, for a doctor-priest who could deal with one phase of disease or whose specialty concerned any one part of the human system was not allowed to touch any other.

Ebers tells us that "though according to every indication the former Egyptian medical man had much real knowledge and skill, yet standing by the bed of sickness as the ordained servant of the divinity, it was but natural he should not be satisfied with a simple rational treatment of the sufferer, but should think he could not dispense with the mystical, and effects of prayers and vows." This recognition of super-physical power has characterized catholicism in medicine always, and is not to be scoffed at in itself, however much we may deplore and contend against its exaltation over exact methods or its use at the hands of ignorance. It has its value today, as it had in "old time, that was before us," and like most other matters affecting health, it too is beginning now to be understood and made an instrument of good, in what we know under the name suggestive therapeutics, which never got sane consideration until after it had remained probationary during most of the 75 years since the modern movement began.

I say 75 years, for the one branch of applied knowledge which now goes farther and deeper into all the affairs of man than any other, the dominating and directing force without which modern life could not proceed a single day, was through all time of which we have any record, down to about 75 years ago, a rather formless quantity, mistily made up of superstition and speculation, blandly credulous of many things and almost wholly uninformed of either the structure, functions, or simplest needs of the human organism. Seventy-five years! Of these the latter 50, and of the latter 50 the last 25, have seen the accretion, the growth, of the splendid body of knowledge we have now. Medicine is the youngest giant of the ages, the wisest and the one that is still growing most rapidly in wisdom and beneficence. It is a strange thing to think of, that this force began its important development almost within the memory of physicians still living. It is a thing to realize with pride and hope that the last score of years have seen it widen out and tower up as in no thousand years of the old time; to see new

realms opening before it even as we stand here, and to know that before its patience and courage and calm power, the horizon of visible and determined fact is receding so fast that wonder has vanished and the secret of life itself looms auroral just beyond the verge, its faint pulsings actually visible to those farthest in the van,

I am, perhaps, not the only man in this room whose term of active practice began in the days when a doctor, especially a country doctor, was fairly well equipped if he had a supply of calomel, jalap, Dover's powders, ipecac, salts and senna, catechu, and tartrate of antimony, and a spring-lancet. If the disease was inflammatory, the doctor of those old days at once tied up the arm and drew a pint of blood, or at least enough to soften the pulse, and then gave an emetic or a dose of calomel and jalap, or both if his judgment indicated. If the trouble was in the chest, and if by his next visit there was no radical improvement, he would apply a fly-blister or some other vivid remedy; and so on.

When I entered fully into work it was in company with a physician who had control of nearly all the practice in our town and neighborhood. He was successful in all the various departments of practical medicine. He did not use half as many remedial agents as are used now, but he always carried his lancet in his vest pocket, and used it freely. He had an extensive obstetric practice, but he had never used a pair of forceps up to the time when I joined him. I was influenced somewhat by his success, and used the lancet liberally for a number of years, though I ceased to carry one when it became unfashionable. However, I always had a pair of delivery forceps with me, and used them when I thought necessary. In my practice, covering half a century, I never lost a patient in confinement. It is not more than 30 years since I first bought and used a clinical thermometer, though now I wonder how I ever got on without one. It was a new thing then, too. I believe it was only some 15 years earlier that Sir Samuel Wilks excited considerable curiosity and amusement by exhibiting one (it was about

a foot long) at a meeting of the British Medical Association. We used to go entirely by the heat of the body and the character of the pulse, and these necessities really produced in the old practitioners a sense of touch that would surprise a modern doctor.

A doctor then carried the pharmacopeia with him. He didn't write prescriptions. He opened his saddle-bags and from their contents compounded his medicines on the spot. He carried his instruments, too; obstetric forceps, a lancet, a scalpel, a syringe, and a limited set of dental tools. If he wore a tall hat, the chances were he had an old-style stethoscope fastened inside it by a clip. If a bandage was required, he tore up an old pillowcase or a sheet, and as like as not asked for a wad of cotton-batting to bind on the wound. He had heard nothing of antiseptics then, and but little of anesthetics. In cases of painful operation the rule would probably be to give the patient a pint of whisky and then hold him down. Looking back over all this, it seems wonderful now that we succeeded as well as we did, and our measure of success was by no means small. The old-time doctor made up for the lack of much that we know now by a shrewd sympathy with and knowledge of his patients. His methods were often idiosyncratic, and much experience developed in him a kind of intuition that stood instead of exact knowledge. I do not care to plead for myself and my equals in age and term of activity, but I must tell you younger men that with all the armor of modernity you are no more capable in yourselves than were your elders, who, comparatively speaking, had to grapple with naked hands and their own best wits the enemies of life. We tell you this, who also have fought with wild beasts at Ephesus. You, our heirs, come gratuitously into the fruits of our victories there.

One cannot help feeling much sympathy with the view taken by Dr Gould, of Philadelphia. "It has been an egotistic habit to republish the nonsense and quackeries and superstitions of medical history," he says, "as conceited

proofs of how superior we are to our forebears. This was as foolish as it was untrue. We are not so mightily superior as we think. When we are really so we shall not boast so much. Neither have we by any means learned all that the ancients and the barbarians have to teach us. Modern armies and cities could still learn a great deal from Moses, one of the greatest men and certainly the greatest sanitarian of history." We must remember, too, that immunization and isolation of infectious diseases go back to Bible times; crude, it is true, but still there. The sanitary regulations established by Moses are sound today, and their disregard brings out the same old diseases. So far as we know, Moses was the creator of preventive medicine. "From whatever source the fragments of his system may have been derived," says Dr Gould, "the system was his own and that of the Powers which guided him. The notion of promoting health by preventing sickness was the foundation of Jewish sanitary legislation," and in much of the ignorant practices of old days were found shrewd prehints of later knowledge. The sympathetic treatment of a sword-cut by salving the blade of the sword also required the wound itself to be kept clean and cool, an unconscious recognition of that asepticism which came to be scientifically known only a few years ago. The method of sanitation that has freed Cuba from yellow fever was unconsciously forecast by the Romans when they drained marshes to prevent malaria, and by the Egyptians who with the same purpose built towers in swampy districts and passed their nights in them, at a height above the ordinary flight of insects. The lower animals taught something of this also in their observed hatred of flies, and as early as 1618 it was suggested that the mosquito might be an agent of malaria. With all this, and much more like it, knowledge slept and its movements were those of a dreamer stirring uneasily in the dark, until these later days.

Just at present we are commonly too much engaged with the pressing business of the moment to remember how much we owe to our predecessors, and more especially to the great

investigators of these few latest decades. We take as matters of course propositions and practices that even so recently as 40 years ago would have been scouted with conservative laughter. Consider where we are today. Blot out only so many years as used to stand for a man's normal span, and see where we stood then, if you would at once and sharply perceive the difference. I may venture to say that well into the nineteenth century, Dr George Cheyne was a rather respectable medical authority. Sir Charles Bell, his contemporary, may be considered authoritative still, but the difference between them was the difference between a priest and a prophet. Yet Dr Cheyne prescribed "salt and essence of human sculls," and in his work on Nervous Diseases, a work most creditable for its day, he prescribes thus for the vapours: "Give nature a fillip as by eating at the next meal some savory and relishing delicacy and drinking some generous wines or liquors."

Only 60 years before Cheyne, Dr John French in a work seriously published in London, advised "Water of the Sperm of Frogs" in cases of fever, and gave this formula: "Take of the frogspawn gathered in March about the new moon, four pounds. Cow-dung fresh, six pounds. Mix them well together, and let them stand the space of one day, then distil them close in ashes. This water allays all hot pains, both inward and outward, in fevers, and especially in gout." I should think it would!

From French to Cheyne was a wide space. From Cheyne to this time the gulf is almost unrealizable. Yet it was in French's time the first native American graduate in medicine, Leonard Hoar, took his degree, first at Harvard and then at Cambridge in England. Cheyne was high in the heavens when the first body was dissected in this country, and when the first American regularly organized school of medicine was founded, at Philadelphia.

Medicine took its modern impetus from the discovery of the germ-origin of disease. Most of the radical changes in the art, and in surgery, in sanitation, in the refinement of

drugs down to active principles, grew either directly or indirectly out of that discovery and its application to practice. It may be pretty safely credited with everything but the introduction of anesthetics. For the pioneer work in these epoch-making departures, we have to thank not more than two or three men, our contemporaries.

Do you realize that Pasteur and Lord Lister are recent, that one of them is yet in the body? That the discoveries in sera really began with Pasteur's forgotten flask of chicken-cholera microbes only 32 years ago? It is almost impossible to grasp the importance of the results that followed upon his researches into fermentation due to outside specific contamination, and those researches occurred within the last half of the nineteenth century. It is true that the suggestion of some diseases might be due to living microorganisms was made by Boyle over 200 years ago, but it received no substantial confirmation until Schoenlien in 1839 discovered the infectious nature of ringworm; and Pasteur's discovery that a live organism was the cause of alcoholic fermentation instantly evoked most vehement protest from the great Liebig and all the schools. "The most advanced scientific thinkers," says Dr Berry Hart, "were eagerly striving to explain the phenomena of life by physical and chemical laws, and the rolé of 'vital force' was being successfully restricted from day to day." I quote from Professor Hart's account of Pasteur's renewed work in Paris in 1878, only 26 years ago: "Today it is difficult for us to picture the incredulity and amazement of many prosperous and self-satisfied practitioners on hearing Pasteur's announcement that he had found the same pus-exciting microorganisms in the pus from a series of boils and in the pus from osteomylitis, and that these conditions, so different in clinical characteristics, are identical as regards etiology." This announcement, received at the time with incredulity, marked the sharp point of departure toward immunism as we know it now. Only 18 years earlier, Dr James Paget in an access of prophetic yearning, having seen signs in an illness of his own, a case

of dissection-poisoning, called for light. "How it comes to pass," he wrote, "no one can surely tell; but the fact of these immunities seems certain." "I wish some of you would study these immunities more than anyone has yet done. They are of infinite interest in physiology, and of still more interest in pathology." His wish has been granted with overflowing fulness, for now the isolation of specific organisms causing disease has become common, and antitoxins, antidotes, or vaccines furnish protection against these diseases, or the means to deal with them, in the first stages at least. This has been carried far, and is enabling a new map of the world in which disease has its geography, so that its fastnesses are being made known, and its forces attacked in the center of their life.

Farther: It is not in these directions alone that the great change has been working. Preventive medicine, widening the domain of knowledge and health, attacking disease at its physical sources, is almost matched in achievement by the corrective forces and the methods they employ. Here comes to the lips involuntarily a very great name, the name of a man still so near us that his true place in perspective is difficult to fix. I mean Lord Lister, the father of antiseptics. It is not too much to say that his work in the Royal Infirmary at Glasgow from 1861 to 1869 revolutionized the practice of surgery in all its branches, and influenced to an almost inconceivable extent the rules of treatment and the management of hospitals and sick-rooms. To tell of the promptness with which he applied the discoveries of Pasteur to his own special line of work would be to rehearse things you all know. But let me read two extracts from a paper by one of his pupils, Sir Hector Cameron. The first shows the conditions in 1861: "I myself," says Sir Hector, "while acting as dresser, have seen no fewer than five cases of pyemia following amputation for injury die in the male accident ward in one week, while other instances of the same disease and of hospital gangrene lay ill in the same ward. The grief and mental worry arising from such experiences

often repeated produced in Lister's mind a sense of discontent with things as they were, and this seemed to many of us who were his pupils in strange contrast to the resignation with which some of his colleagues viewed similar experiences. They appeared to regard them as inevitable and quite unpreventable so long as the human body was what it was." Turn to 1869, only eight years later, and see the change: "Wounds were found to heal without inflammation, suppuration, or constitutional disturbance; compound fractures and dislocations were robbed of the former dangers which surrounded them; large chronic abscesses connected with bone disease were proved to be no longer incurable, even when occurring in the adult; arterial trunks were ligatured in their continuity without fear of secondary hemorrhage or other mishap; joints, opened whether by accident or by the surgeon's knife, healed without a disquieting symptom; reunited fractures were treated boldly by removing the ends of the fragments in open wounds; and incursions were made with success into departments of practice which up to that date had been looked upon as forbidden ground."

"I have operated on you. May God cure you," was the saying of Ambrose Pare, the great French physician and surgeon of the sixteenth century. To all intents the phrase expresed the attitude of the surgeon of our own time, down to just the other day. Here is one change which as sharply as any other defines the advance. Formerly, a surgeon's responsibility ceased when he had operated. Now, it begins there. To do his whole duty, he must see the successful issue of his work. But what a vast advantage he has over the surgeon of the fifties! Radiophotography, asepsis, anesthetics, sure lights to work by, precise instruments, cleanliness impeccable, skilled help at his elbow, all the resources of a profound chemistry. These have recreated surgery within the memory and observation of men still in daily practice. Outside the department of surgery, in every phase of treatment, in obstetrics, in gynecology, in all the appliances wherever there is sickness, who could dispense with

the methods we owe to Lister and his group? They are making life by saving and prolonging life.

As everything that mitigates pain minimizes nerve waste and so also prolongs life, who can estimate humanity's debt to anesthetics, which with our own eyes we have seen spread from small and doubtful beginnings to one of the most familiar blessings science has bestowed upon our race, and one of the most indispensable? Dr Horace Wells, who by resolution of the Boston Medical Asociation in 1870 was credited with the scientific formulation of this discovery, made his first successful demonstration no longer ago than October 16, 1846. How much of the work of Lister or of any of the other great surgeons or physicians would have been possible without the aid of this thing, which we use so commonly that we are apt to forget how high it stands among the agencies that hold up health that increase the years of life? For these years are more than they used to be.

The time has been since the middle of the nineteenth century when a man of 50 was called old. At 60 he had by common consent, including his own, passed out of real activity. Think of that as compared with the present! Andrew Carnegie says that after 65 a man should devote his energies to living and the doing of good works, meaning that after 65 he should leave the more strenuous activities to younger men, not that he should cease or even become otiose. The average life is longer than it has been since patriarchal ages. The insurance actuaries show this by a system of quite unsentimental figures, governing one of the most closely administered of all business interests. The authority of medicine is to be thanked for the change. Discovery and the wisdom that directs knowledge well applied have operated to an improvement in the methods of living, both in public sanitation, private conduct and the treatment of ailments common to civilized humanity, so as to set back the death-date and advance the average of personal health and the individual's term of useful activity.

For example, take the membership of the United States Senate, or, in fact, almost any other group of men above the merely middle social station would serve to illustrate the same truth.

I would only be restating familiar things if I were to review the other principal saliencies of these momentous years. The names of the great discoverers in biology, surgery, pathology, the calm geniuses of chemistry, are fixed in the roll of fame. You know them all, and the achievements of the men who bore and bear them; but one solemn concretion of their great work I would like to approach for a moment.

They have led us far toward the doorway whence issues fundamental life—very far toward a revelation of some vital phase of that vast ultimate which Herbert Spencer had declared was unknowable to either science or religion. The discoveries of Loeb and Mathews here in America, and of other earnest biologists elsewhere, have brought us very near to that mysterious impulse which lies back of all life manifestations. At the same time and by means almost at the other extreme, the profound investigators who may be said to have taken their initiative from Darwin, have approached the same force so nearly that its presence, no longer deniable, has shaken every accepted doctrine in physics, and indicates the overthrow of every system of materiality heretofore accepted as final. The active principle of life is on the one hand; on the other, we find the question (to call it no more) whether all life and all matter are more or less the manifestations of one primal force, and what that force is. These two great things ringing in the world call us forward to the new revelation, to a dispensation under which much of today's accepted knowledge will pass into the region of aborted things. Men now listening to my voice will live to see and know things before which the wisdom of old time and this time will trail away like mists before the sun, and under God, this will be won by the cold, clear workings of men's minds. Knowledge is not traveling toward us on

streams of light proceeding from its great central source. We are winning to it by faithful labor over the fields that spread toward the dawn, and in its growing floods we are enabled at last to "look through Nature up to Nature's God." This is no figure of speech. It is truth in the plainest form.

"It is only by joining the study of revealed truth with that of science," says Sir James Paget, "that our science can be perfected. We stand, as it were, in the center of an area of light and truth, and whichever way we move, except in one, we soon come to the twilight, and then to the deep darkness of that on which the light of science has not yet shone. In that one direction there is no twilight; there, if we follow in the line of truth and do not refuse with a mad conceit the proferred help, the path of Revelation and the light of science is not lost; it merges into the more glorious light of faith." Faith has always taught us the omniscience, the omnipotence of God. Science is demonstrating them. He has been from the beginning discernible to Faith, and, to Faith's poor crippled sister, superstition. This same superstition, usurping the function of her purer sister, has stood by the bed of suffering not only in old Egypt, but in every land and in every age, down to this land and this hour. The instruments of darkness have bunglingly used the elements of truth. Now let me plead that in the broad spirit of today, and in the knowledge that has been vouchsafed us, we do what may be in us of immediate duty, and justify our membership in the ranks of this profession by redeeming from abuse the elusive but very real forces that play through every man, that biology and chemistry have shown us to be actual.

The relations between the discoveries of Loeb and Curie on the one hand, and the department of suggestive therapeutics on the other, may at first glance appear tenuous; but are they so? The life-impulse of Loeb and the force that transmutes metals by radial action, the removed intelligence back of a man's mind that is superior to and can direct his will, are not these illustrations of it? There is an old force

moving around us. Only its discovery is new, and not yet complete. It is on this subject as affecting what we know as suggestive therapeutics that I wish to say a few things before I close. The element or the effect underlying it is the same that we perhaps know best by the name of hypnosis. The subject has been treated with importance by a large body of capable and earnest physicians, whose efforts to produce a system admissible and proper in general practice have had results the importance of which we have not yet fully recognized. Every physician knows that his case is far along when he has made his patient believe in him. To that extent we all practice "suggestion" or the faith cure. Then we give medicines. Are we, however, doing all our duty in the world when we stop with that rudimentary use of a physic element in practice and leave the rest to the mercy of great numbers, even organized numbers, who disclaim and discard medicine altogether and trust to faith alone to make a sufferer whole? It is not just nor fair to decry any form of spiritual belief as such held by any number of people so they hold it honestly. All such beliefs have in them some trace of truth. Faith may make whole, as any one may read; but in the same book we also read that even Moses had recourse to the apothecary's art when he compounded the sacred oil; and the prophets had evident faith, in physicians. Jeremiah asked with something like acerbity what was the trouble in Gilead. "Is there no physician there?" Good King Asa, when his disorder began to afflict him sorely "sought not the Lord, but his physicians." To take up the Bible as authoritative ground for a system of "faith healing," so-called, is to pick up that which may turn upon the user. Qualified physicians are not excused from the lawful use of mental or physic agencies by the mere circumstance that those agencies are unlawfully used by pretenders and quacks, especially when so many honest, able, scientific men have for so long been trying to impart light on the subject. Let me read something written by Dr Alfred Garratt, of Boston:

"It is not honorable, nor is it just to the rising generation, for physicians and other cultivated and respectable bodies, or for individuals now, in the midst of the electric blaze of modern science, humanity and Christianity, to condone, countenance, or even tolerate by silent connivance, a subtle and dangerous *organized error* that presumes to claim and assume the attitude of being a part of the great medical profession; in which fact every individual in society is interested."

That is sound common sense, and stands out as a protest against the apathy of physicians toward the irregular and dangerous army of ignorant and unskilled men, who in one form or another, have so largely occupied the field of suggestive therapeutics and claimed it for their own on grounds *quasi*-religious or openly profane. It is the presence of these mistaken and sometimes dishonest people that has recently moved some physicians to protest and to warnings.

"The modern physician," says Dr Henrik Petersen, "must study psychological causes and effects. The nature of his life's work makes this imperative. He must adopt that which observation and experience prove to be the best under existing circumstances, and never meet such aid with any prejudiced questioning into its origin. Intelligent and lucid dissemination of psychological medicine is needed in this country, where, more than elsewhere, perhaps, such knowledge has been riotous or apathetic, presented either by enthusiastic ignorance, or by a too confident conservatism. We need now to make our laboratory and text-book psychology a living factor in daily life, and a practical aid to the sufferer."

All along the line we encounter this agent and find ourselves addressed by its advocates, who not only ask cooperation, but themselves spread their application of it and labor to increase the dignity and importance in which they desire it to be held by their brethren. So earnest and so well applied have been their efforts that no system of practice can longer be called complete which fails to take account

of it. This result has been effected in rather singular fashion by the readiness with which quackery on the one hand and mistaken religious zeal on the other have been attracted to its perversion, undue exaltation, or dangerous abuse. It is becoming, if it has not already become a necessary move, to take it within the clear lines of legitimacy and to beat off the unclean hands that have been laid upon it.

Efforts to prove hypnotic control of an accused person have been common in our courts, and though seldom successful, they are none the less significant of the danger this power has in it, unless its exercise be controlled and made a matter of proper understanding by established professional authority. "Hypnotic suggestion creates nothing," says Dr Wetterstrand, of Stockholm. "It revives or deadens the spark for good or evil latent in every human breast." As to the kind of subjects most amenable to it, and the class of disorders, whether organic or functional, to which it best applies, opinion is divided. I will quote two writers, one on each side of the question. Dr Harter, of New York, says: "It is very generally supposed, even by members of the medical profession who keep abreast of the times, that hypnosis is a pathological state, a neurosis, which can be best studied in the subjects of hysteria. This belief is largely the consequence of the teachings of the Paris school, of which Charcot is the chief exponent, and one of the principal merits of Professor Bernheim's work is the conclusive manner in which he shows that hypnotism, far from being a neurosis, is a phenomenon closely allied to natural sleep." Somewhat opposing this comes Dr William T. Belfield, of Chicago, an earnest student, whose opinions are entitled to respect, and who says that "mental influences are of demonstrable value in the treatment not of organic, but of functional, that is emotional, disease. *This* is the field in which mental suggestion, whether called by its proper title or misnamed Christian science, faith cure, animal magnetism, Divine healing, or the bone of a saint, does unquestionably cure an occasional patient whom physicians, drugs, and

reason have failed to relieve. The subjects of these diseases are emotional. * * Physicians include such emotional states under the general term hysteria. Now this word does not mean, as the average layman thinks, merely an alternation of senseless laughter and tears; nor does it imply, as the average physician thinks, conscious deceit on the part of the hysterical patient. Hysteria means any functional derangement due to emotion, and displays affections of all parts of the body, such as dyspepsia, paralysis, rigidity of joints, spinal curvature, the trance, even blindness; and these derangements may be just as honest and real, just as far beyond the control of the conscious mind, as are nausea, faintness, even vomiting, induced in many men by a ghastly sight or a disgusting odor. Any influence which will restore the emotional balance of such a patient will thereby rapidly cure a hysterical disease, even blindness. Physicians busied with the obvious ravages of organic disease, but too often ignore the subtle influence of the emotions; and their negligence is the opportunity of the charlatan."

For my own part, I am not clear that these two declarations differ so much in essence as in terms, for they agree as to the value of the effects produced, and Dr Belfield's position is modified by his giving hysteria a definition wide enough to include a large majority of human kind.

I need not go farther. The fact of my having the attention of a body of regular physicians to what I have said in respect of suggestive therapeutics, constitutes in itself a whole lecture on the advance in the medical point of view during the last 50 years. We have advanced and broadened almost miraculously for even this age, when the once unbelievable has become the accepted commonplace in almost every department of science and art and life itself. We are advancing still with all the acceleration of our recent past to help us on; and if we are, as I believe we are, to go forward as we have come forward, steadily, with surety and without any emotion of either enthusiasm or dread, it will be by doing as we have done; by applying St. Paul's immortal rule to "prove all things, and hold fast that which is good."

Modern Medicine

By D. W. McQueen, M. D., Camden

In presenting this paper the writer wishes to state that it is no way intended as a criticism; that it is simply the citation of a few facts as seen by a simple practitioner of medicine who lays no claims to "wit, nor words, nor worth." He has drawn on his own experience believing that "An honest confession is good for the soul."

In the beginning of his career the writer believed with Dr Oliver Wendell Holmes that he had 20 remedies for every disease (and I fear used them all in many cases), and that disease was absolutely his victim. The later experiences of the good old doctor in which he had 20 diseases for every remedy might do for those old fogy days, but did not appeal to the young practitioner of '93. My first few cases were eminently successful, my remedies cured case after case of tonsillitis, pneumonia, rheumatism, gastritis, and even a case of diabetes mellitus. In fact, it was wonderful how these diseases fell before the awful scythe of medicine. Then how I scoffed at Dr Holmes—how I revere him now.

In the second year of my practice, I was consulted by a young married woman who said she had heart trouble, the older doctors had been treating her for several months with no apparent benefit, hence, thought she would try the young doctor. Here evidently was an easy case, a ready-made diagnosis, substantiated by a rapid, irregular pulse, systolic bruit, shortness of breath, and marked pallor; the urine showed nothing (as I did not take the specific gravity nor examine for urea). The older doctors had evidently not medicated properly, so I applied bromids and digitalis. In six weeks the patient was dead, and postmortem examination revealed parenchymatous nephritis. This was a terrible jolt to my professional vanity, and my faith both in myself and medicine began to waver. In the fall of my second year I had three deaths from typhoid, and this did

not help my confidence in medication. Then another case of diabetes mellitus appeared which simply resisted all medication, steadily going from bad to worse.

But lo! A Joshua appears. In my good old medical journal appeared an article written by a prominent physician in which a certain drug had in his hands cured 80% of his cases of diabetes mellitus. I embraced my Joshua with the ardor of a school boy and cried its value to my patient, a positive cure was almost in sight, the patient was immediately enthused and took the medicine with unwavering regularity, but alas, my Joshua proved my Jonah. Vale patient, vale reputation! Not long after this experience appeared another article in my good old journal, subscribed to by another prominent physician, utterly condemning the drug I had used, and expiating on the benefits derived from another preparation manufactured by so and so, which was in his opinion almost a specific.

Possibly my medical career would have ended here had it not been for the advice of an old medical friend in a neighboring city, a man of whom it may be truly said "He was an honor to his profession." In relating some of my troubles to him he said: "My boy, when you have a broken leg you put it in splints, Nature does the rest and does it well; now, then make a positive diagnosis if you can, use the same principles you used with the broken leg, use few drugs and use them well and you will succeed."

Then the words of the late Dr Whitaker came to me, as, during his lecture, he would hold his hands before him and in that still, small voice which so electrified his hearers, he would say: "Gentlemen, I can count on my fingers the drugs which I use in my daily practice."

At a meeting of a county medical society the subject of digitalis was discussed. A young doctor, graduated from one of our best Ohio schools, a man who was full of intelligence and versed in all up-to-date methods, was asked to make some remarks on his method of administering the drug, and he replied, "that in his practice he never gave

digitalis until compensation had been established; that he had realized better results in administering it in this way."

A consultation was held with another young man, a graduate of the same school, who gave six different prescriptions to the same patient, four of them of the shotgun variety. The friends of the patient had delegated one of their number to keep track with pencil and paper the hours when the medicine should be given, and he resigned his position as he said the task was too much for human brain.

Another consultation was held, this time with a young man from another of our Ohio schools. The patient's gums were livid and the teeth loose from administration of mercury in tablet, which the young man had been giving, and had overlooked the fact that it contained mercury; hence, had not recognized the existence of salivation.

It is not the purpose of the writer to show the mote in his brother's eye with the beam already in his own eye, but is it wrong to ask the reason for the methods often pursued by the young practitioner and not infrequently by his older brother? Is the fault entirely his, or can part of it be traced elsewhere? Is it possible that his Alma Mater in her anxiety to thoroughly equip him has overshot the mark and so confused him that he doesn't know exactly "where he's at," or is he confused by the different opinions held by different members of the faculty?

Blood is thicker than water, and far be it from me to cast any reflections upon my teaching or lay my mistakes at the door of my Alma Mater. I am proud to have been the pupil of every member of her faculty, but go with me if you will to the surgical clinic of any college or hospital, and you will very likely hear something like this: "Our medical friends will tell you that the majority of these cases are cured by medicine; however, the history of this clinic shows that the majority do not get well without surgical interference." Step across the hall into the medical clinic and hear something like this: "The surgeon will tell you that the majority of these cases do not recover without

operation; however, it has been the experience of this clinic that fully 80% recover, without operation." Can you imagine anything more confusing to the student or post-graduate than such diversity of opinion?

So long as the surgeon winks the other eye at medicine, and the medical man in turn holds up his hands in horror of the knife, so long will there be confusion in the ranks of medicine, and so long will thrive the fads, isms and pathys of the quacks, healers and charlatans. There is enough good in medicine and surgery to crush these fanatics into a faded memory, but there is also enough that is bad to give them an existence.

E pluribus unum was never truer of the United States than it is of the medical profession of today. The interest of the surgeon is the interest of the therapeutist and the interest of the specialist is the interest of all. None are great except in using their best endeavors to further the interest of general medicine. Reprints bearing these startling headlines, "Two hundred consecutive sections without a death," or some observations on the use of a certain drug bearing a foreign stamp, no longer appeal to the general practitioner. Still more disgusting is the daily loading of one's desk with nostrums too often bearing the stamp of those supposed to stand high in their profession.

Modern medicine believes in drugs. "Those few thou hast and their adoption tried grapple them to thy soul with hoops of steel," but do not dull thy palm with entertainment of each new hatched fledgeling. There is not present in this assembly one who would not rather trust himself in the hands of a physician who uses a dozen drugs well than one who uses the smattering of an hundred. We should beware lest we become simply the distributing agents of the different pharmaceutic houses. The doctor too frequently forgets that his compensation should be strictly for his time and advice, that his patient consults him for what he knows and not for his ability to dispense medicine.

It is the commercial feature which enables the pro-

prietary hypocrite to foist his wares before an unsuspecting public, and even advertise himself in an inaugural parade.

How better can we correct this than by teaching the people how little they are in need of medicine and how much they are in need of advice. They had much rather pay you for advice that will cure them than be burdened with the taking of a drug.

God forbid that the spirit of the money god shall wind its loathsome track into the grand old institution of medicine. Let us not fail to remember that we are but seekers after truth, and that we may soon come to realize the fact that there is much good in real medicine and no real good in much medicine; that there is much good in real surgery and no real good in much surgery.

Experimental Inquiry into the Causation of Caisson Disease with Remarks on its Prevention and Treatment*

By J. J. R. MacLeod, M. D., M. B. (Aberd.), D. P. H. (Camb.),
Cleveland

Professor of Physiology Western Reserve University; formerly MacKinnon Scholar of the Royal Society of London

Divers and workmen in caissons are susceptible to a peculiar disease which is frequently of sufficient severity to cause death, but may be so mild as almost to escape notice. The symptoms of the disease first appear, not when the worker is subjected to the high pressure, but after he has come back to atmospheric pressure.

A caisson is a steel or wooden chamber sunk in water and out of which the water is kept by means of compressed air. For the passage of the workmen and of material, into and out of the caisson, the latter is connected with a second smaller chamber fitted with air-locks and decompressing cocks. A diver works in a waterproof suit, the head being en-

*Full details of this inquiry are given in the *Journal of Hygiene*, Vol. page 407.

closed in a copper helmet connected by hose with air pumps. Every 10 meters or 33 feet of water corresponds to one atmosphere pressure (15 pounds to the square inch), so that at this depth the total air pressure in a caisson, or in a diver's helmet, would require 30 pounds to the square inch, that is +1 atmosphere.

While in this compressed air the worker as a rule suffers no discomfort. When he enters a stuffiness may be felt in the ears and temporary giddiness; the respiration and pulse-rate may slow and frequency of micturition may be noticed. In the numerous cases which have been investigated none of the symptoms of caisson disease, as we will describe them below, have been noted. It is after the caissonier or diver has been decompressed (after he has returned to normal atmospheric pressure) that the symptoms appear. The exact time of their onset may be immediately after decompression or not for several hours. The worker may have returned home and spent the evening feeling perfectly well, and have noticed nothing until he went to bed. The cases of late onset are usually not serious, the symptoms including muscular and joint pains, vertigo, embarrassed breathing, pains in the ears and deafness, vomiting and epigastric pain; the pulse may quicken and the face become flushed, the skin frequently feels cold, and there may be hemoplysis or blood in the stools. These symptoms pass off after some hours, but the arthralgia and myalgia sometimes persist for a considerable time.

In the more severe cases the first symptom is, again, pain in the muscles and joints; this is of great severity and is usually quickly followed by motor paralysis, so that the patient falls. Soon after he becomes more or less unconscious, the pulse is almost imperceptible, the respiration is labored, sometimes even asphyxiated, the face cyanosed, and the surface of the body cold. Many of the cases are fatal. In some cases, indeed, death is almost instantaneous. The patient, shortly after being decompressed, falls unconscious and expires within a few minutes. Such cases are common

in careless diving, when the divers, to get quickly to the boat, screw up the outlet valve in their helmets so as to fill their suits with air which carries them to the surface, where they decompress themselves by again opening the valve.

Autopsies of persons dead of caisson disease have shown, as a rule, intense congestion of the viscera, hemorrhages in the spinal cord and brain, and ecchymoses on the pleura and pericardium. In some cases interlobar emphysema of the lungs and laceration of the spinal cord and brain have been noted.

We are now in a position to consider what is the cause of these symptoms. The phenomena observed in local compression of the body, and in cupping, the pallor of caissoniers, the congestion of the viscera seen in autopsies, and the occasional hemorrhages, have led most medical men to the erroneous conclusion that the blood under pressure is driven from the exterior and compressed in the viscera; "the centers will be congested at the expense of the periphery" (A. H. Smith) and hemorrhage and congestion will result. Babington tells us that the brain and spinal cord, shut up in their osseous cavities, are not able, like other elastic parts, to quickly accommodate themselves to changes of pressure.

All such theories are of course entirely wrong, and the neglect of these writers of simple physical laws is the less excusable, seeing that Poisseuille in 1835 observed the capillary circulation in frogs and young mice enclosed in a glass chamber and subjected to +2-+3 atmospheric pressure, and found the circulation unaffected. Again in 1881 Paul Bert clearly pointed out the physical error in all such theories. The fluids of the body—and all tissues, even the bones, are full of fluid—are incompressible. Pressure applied to any part of the body will be immediately distributed equally to every other part. If this were not so, life would be impossible under *any* variation of atmospheric pressure.

Leonard Hill, F. R. S., of London, and myself have repeated several of Paul Bert's experiments and added others

of our own to prove that all the symptoms of caisson disease are due to *decompression,* and not, in the slightest degree, to the mechanical effect of the pressure itself. When an animal is under pressure its tissue fluids dissolve a large amount of gas. They absorb it in obeyance to Dalton's law of solution of a gas in a fluid. This law states that the amount of gas dissolved in water is directly proportional to the partial pressure of that gas in the atmosphere; at two atmospheric pressures twice as much gas will pass into solution as at zero pressure. If we allow that at atmospheric pressure the plasm and other tissue fluids contain in solution 1.2 cc. of nitrogen in each 100 grams of blood, then at two atmospheres (or +1 atmos.) 2.4 cc. will become dissolved, and so on. So long as the gas is in simple solution it does not in any way change the physical condition of the blood, etc. If, however, the animal be suddenly decompressed (*i. e.,* the pressure of air surrounding it be reduced to zero) the dissolved gas will be so quickly thrown out of solution that it will cause the blood, etc., to froth. It is the bubbles of gas thus set free that cause all the symptoms of caisson disease. They act as air emboli sticking in the pulmonic capillaries or blocking up a terminal artery in the brain; or they may be large and tear the capillary wall and so lead to hemorrhage. If these bubbles are produced in the posterior spinal roots, intense pain results; if in the anterior, motor paralysis. Frothing of the blood in the heart impedes the action of the organ and death soon follows.

The following are the experiments briefly stated which Leonard Hill and myself performed to prove this statement:

1. We placed a frog in a small steel chamber connected with a cylinder of compressed air and provided with two windows by which a strong arc light could be passed through the chamber. The web of the frog was stretched on a wire and fixed so that the small blood-vessels in it could be seen by applying a microscope to the outside of the window. The circulation of the blood in the vessels was carefully observed at atmospheric pressure, and then a posi-

tive pressure, amounting in some of our experiments to +50 atmospheres was introduced. The latter had absolutely no effect on the circulating blood. By opening a tap in the chamber, decompression to zero pressure was quickly effected and, immediately, were seen to develop in the blood large bubbles of gas, blocking the vessels and producing stasis. The bubbles were derived from the gas which had gone into solution under pressure. By reapplying the pressure the bubbles of gas again went into solution and the blood circulated normally. The whole process is exemplified in a bottle of aerated water; if the cork in such a bottle be drawn, the dissolved gas escapes as bubbles and effervescence results; if now the bottle be recorked, the gas reenters solution and the fluid becomes quiet. The dissolved gas in the blood may be liberated without forming emboli provided the decompression be gradual. We have shown this over and over again in our experiments, and the fact is *the essential thing to remember in preventing caisson disease.* To take our example of the bottle of aerated water, if a pin hole be made in the cork the gas will gradually escape and effervescence will result.

2. We placed an anesthetized rabbit in a large pressure chamber and recorded its mean arterial blood-pressure in the usual way; under +7 atmospheres pressure the blood-pressure curve was exactly the same as at zero pressure.

3. Messrs Liebe and Gorman, the diving engineers of London, constructed for us a pressure chamber large enough for observation on dogs, cats, etc. This chamber was provided with an observation window and illuminated in its interior by electric light. We have carefully observed numerous animals subjected to various pressures in this chamber, but have never seen any symptoms of caisson disease when the animal was under pressure; or after decompression, if this were *slow enough* to allow the gas dissolved in the tissue fluid to escape gradually. If, however, the decompression was quickly done, symptoms exactly like those described above were produced, and on *postmortem* examina-

tion the blood, lymph, etc., were found filled with gas bubbles. Histologic examination of the various tissues revealed, especially in the nervous system, numerous hemorrhages, lacerations, and cyst-like spaces (air bubbles).

It is interesting in this connection to note that general subcutaneous emphysema has been noted by Pol and Watelle in a subject dead of caisson disease, and that E. H. Swell thought he could detect emphysema in one of the numerous cases of "bends" which came under his observation in the construction of the Blackwall tunnel.

These experiments prove then, once and for all, that the pressure has no mechanical effect on the circulation, and they overthrow all the mechanical congestion theories of caisson illness.

In connection with the solution of the compressed air in the tissue fluids, we have carried out investigations to determine exactly how much gas the blood of an animal subjected to high pressures does contain; how long it takes to absorb its maximal amount of gas and how long it takes, after decompression, for the dissolved gas to be set free. These experiments were performed on anesthetized dogs placed in the large chamber described above, the carotid artery being connected by tubing, with an outlet tap in the chamber. By opening this tap, blood could be collected for analytic purposes. We found, briefly stated, that the gases which increased in amount were nitrogen and oxygen and that *these became dissolved in the blood according to Dalton's law,* although it took some time before all the gas became dissolved as required by this law. The fact that it takes some time for the blood to dissolve its full amount of gas must at first sight seem surprising, for one would imagine that instant saturation of the blood with gas would be obtained in the thin film which it produces in the alveolar wall. The cause of delay is undoubtedly that the tissue fluids, other than the blood, lymph, and cell plasma, take some time to absorb the gas carried to them *via* the blood. This explains why short shifts are far less dangerous for

divers and caissoniers. The shorter the shift the less becomes the saturation, and the less gas is set free on decompression.

The next part of our research relates to the *conditions necessary for safe decompression,* and to the *rational treatment* of the decompression symptoms, should these be already present.

A cat was placed in the large pressure chamber and the pressure raised as quickly as possible to 105 pounds (+7 atmos.), and then quickly decompressed. The cat survived, for the tissue fluids had not become sufficiently saturated with air. This experiment shows the importance of short shifts under high pressures. In other experiments, animals were kept under pressure (+7 atmos.) for some time, and these invariably died when quickly decompressed. If about as long a time were taken in decompressing as it takes for the blood to dissolve its full amount of gas (about 1½ hours for large animals) no symptoms of decompression appeared. The importance of slow decompression is illustrated in the following experiments on monkeys *Rhesus.* One of these was subjected to a pressure of +7 atmos. air for an hour. It was then slowly decompressed from 107 pounds to 10 pounds (taking 55 minutes) when the large outlet valve was opened and decompression to zero pressure quickly effected. On opening the chamber the monkey seemed perfectly normal, and on removing him he struggled hard to escape, when, all at once, he suddenly became quiet and lay on his side gasping and with a peculiar cry. He gradually became dyspneic and his lips, tongue, and face were deeply cyanosed. Despite energetic artificial respiration, he died in about 10 minutes after removal from the chamber. Caisson disease could not have been more typically portrayed than here.

Another monkey was exposed to the same pressure for the same time but was decompressed very slowly (in two hours) and showed no symptoms. The experiment was repeated on this monkey three or four times a week for a

month and there was never the slightest sign of decompression symptoms. The monkey was perfectly normal under this very high pressure (corresponding to over 240 feet of water) and maintained his body weight.

Decompression symptoms—in other words "caisson disease"—can be entirely prevented by careful decompression.

With regard to the *treatment* of the decompression symptoms we have already shown in the observation on the frog's web that this consists in a reapplication of the pressure. To demonstrate the efficacy of such treatment on higher animals the following experiments may be cited: A large hutch rabbit was kept under a pressure of +7 atmos. for four hours, and then was quickly decompressed. In a minute or so typical decompression convulsions appeared. A cylinder of compressed air was then emptied into the chamber and the pressure thus reapplied. The symptoms, however, remained unabated, and the rabbit soon died. It was evident, from the experiment, that for the reapplication of pressure to be of any avail, the pressure must be very quickly reestablished and no time be given for the air bubbles to tear up, and damage permanently the nervous tissues, nor to produce stasis of the circulation for a long period. We, therefore, repeated the experiment with the modification that the pressure was more quickly reapplied.

A cat and a hutch rabbit were subjected to an air pressure of +7 atmos. for four hours. Decompression was effected to zero in about five seconds, and as quickly as the taps could be opened (about five seconds) a large cylinder of compressed air was delivered into the chamber, thus raising the pressure to 95 pounds in about two minutes.

At the moment of decompression the cat sprang to the window excited, and soon became entirely paralyzed in the limbs, so that it fell helpless on its side. Its head meanwhile showing continuous side-to-side pendulum-like movements. On recompressing, these symptoms gradually disappeared. The head movement being the first to go. The pressure was maintained for 45 minutes and then was slowly

lowered to zero. The cat and the rabbit (which has shown no symptoms) were found to be perfectly normal when they were removed. There is no doubt, then, that recompression, after rapid decompression, causes resolution of the gas bubbles in the blood, etc., and can save the life of the animal.

Recompression has been tried at several caisson works, and when intelligently used has been found to yield excellent results. For its application, a medical lock is constructed (Hudson Tunnel, Blackwall Tunnel). The treatment must be applied at once and must be controled by a medical man. We cannot believe the statement by some engineers that this treatment is of no use. We can only surmise that the treatment has not been adequately adopted.

We have studied all the cases of caisson and diver's disease recorded in the literature, and from a study of these and from the results of our own experiments, we can formulate the following *conditions for safe working:*

1. The men selected, especially for high-pressure work, should be small men of spare and wiry habit, not older than 25. They should be total abstainers and abstemious in all their habits.

2. The men should be tested at low pressure first, and those who suffer from any symptoms should be discharged.

3. We suggest the following times of compression and decompression as safe for different depths:

Atmosphere	Lbs. pressure	Shift	Decompression period.
2	30	4 hrs.	30 min.—1 hr.
3-4	45-60	4 hrs.	1—2 hrs.
5	75	1 hr.	1—2 hrs.
6-7	90-105	30 min.—1 hr.	2 hrs.

To prevent men breaking the rules, the decompression chamber should be provided with one cock only, which will allow decompression to take place in a given time. A separate lock should be provided for the rapid passage of material. The decompression chamber must be artificially warmed so that the temperature does not fall below 60° F., and it must be thoroughly ventilated during decompression.

4. The ventilation of the diving apparatus, or caisson, should be very free and the temperature of the air about 60° F.

5. The men should remain quiet for an hour or so after decompression and be recompressed on any sign of sickness.

To conclude, *we are of the opinion, that by proper choice of men and regulation of the shift and decompression period, work could be carried on without loss of life at a depth of even 200 feet, that is, about +7 atmos. or +100 pounds pressure.*

In deep sea diving, we have elaborated, in conjunction with Messrs. Liehe and Gorman, a system of diving which we are confident will permit safe work at 200 feet.

A Neglected Factor in a Medical Problem

By David R. Silver, M. D., Sidney

The medical profession of this country is now engaged in the solution of a perplexing problem. The question is not a new one. On the contrary, it is as old as the healing art. If medicine be the noblest of the professions, for that very reason it draws to it a host of pretenders. Whatever has been the history of the past is likely to be the experience of the future.

Those who have had some taste of our benevolent art, but are unable to discern the true from the false, are frequent victims of their own ignorance.

For at least a third of a century there has been gradual and rapid improvement in our own ranks. The standards have been raised, educational tests are rigid, incompetent individuals are being weeded out, and laws regulating practice are not only enacted, but are enforced.

In short, the medical profession has been putting its house in order, attending to its sanitation and caring for the ills of its occupants, so that the proverb, "physician, heal thyself," may not be successfully quoted against it. To crown all, we have a great organization, embracing every

county in the State, which this year will display an object-lesson to politician and charlatan.

Nevertheless, there remains much to be done. There are divisions in the ranks of the legally qualified which ought not to be. For these barriers to professional fellowship there is no possible excuse. So long as the profession as a whole does not present a united front, it will be to that extent weak and will fail to impress the laity, the public, with its honesty of purpose in demanding the protection of the law.

This Association has done what it can to secure union. Let those with greed for gain, itching for notoriety, and zeal in a senseless and waning cause, bear the odium of present conditions. Let it be understood that he who will exploit his so-called "school" for personal gain, is in the same class with the nostrum vendor and the advertising impostor. He is a stumbling-block and a rock of offense; he is bound to his idols; let him alone.

So much for the trouble inside the profession—what of the conditions outside? It must be apparent to the most superficial observer that education does not make men honest. In fact, an educated pretender is the most dangerous kind of fraud. Graduation at a medical college, supplemented by a certificate from the State Board of Registration and Examination, is only a legal passport and protection to any scamp who prefers fleecing the public to doing honest work in legitimate ways. In proof of this you have only to examine the advertising columns of the newspaper. To reach this class it is necessary to carry education, not to the impostor, but to the victim. Doing this strikes a blow at the same time at the patent medicine evil, than which there is none greater; no, not one.

In the judgment of conservative men, it stands side by side with the saloon and the brothel in debasing tendencies. Taken in connection with the havoc and the ruin wrought in the minds of the young, the immature, and the weak and credulous by filthy, obscene, often suggestive pictures, and the crafty wording of paid experts in the fine art of decep-

tive writing, and there can be no question that this opinion is well founded.

It is not a matter of pecuniary damage to us; not at all. Since the moral and physical health of thousands of people is ruined yearly by the use of such nostrums, it is problematic to what extent we suffer financially. This view would be unworthy of our consideration. This body of intelligent men need not be told the dangerous results following the continuous use of proprietary remedies containing alcohol, opium, cocain, chloral and other narcotics. That the best selling of these compounds do contain as ingredients one or more of these powerful and seductive drugs, is fully proved by analysis. That they do not contain anything unknown to us is also fully established. Hence, they are in every sense dangerous and fraudulent.

The people are aware that medical men do not approve of the treatment of disease by proprietary medicine. They assume that this objection is founded on pecuniary considerations, which is not the fact. On the other hand, we commit an equally grievous error by an equally gratuitous assumption.

Barnum's dictum that people like to be humbugged is not true. If it were true it would not change our duty as conservators of the public health. Responsibility for the propagation of truth is not affected by the vagaries of the human mind. It becomes us to make inquiry to what extent we are responsible in permitting people to believe that medicine is a mystery, and the healing art a sort of scientific jugglery. Not a step has been taken to bring to the comprehension of the college graduate, nor of the university teacher, the principles of medicine and the natural history of disease.

On these subjects the judges of the Supreme Court of the United States are about as ignorant as are the members of the freshman class of a high school.

Though there are exceptions to the rule no one expects a physician to fall a victim to charlatanry. The explanation is plain. His education has been along right lines to prevent

[illegible]

[illegible] However humiliating the confession, it is true; but it is untrue to assert that people like to be humbugged.

This assertion has never appealed to my reason. I do not believe that people have any desire whatever to be deceived. Deception argues want of knowledge. The essence of deception is ignorance. The man who is cheated in a horse trade is the man who does not know horses. The man who loses in a game is the man who is not up to the tricks. The sick want to get well. The imagination is inflamed by promises. The reason cannot come to the rescue because it has no basis in education. Surely the ignorant are not to blame. Surely you cannot expect the blind to keep out of the ditch. Surely the enlightened must be the teachers, and what are we doing

to give the people such knowledge as they need? Nothing, absolutely nothing.

For some unknown reason studies along this line of scientific research are not regarded with favor in a liberal education, and yet the author of "The Intellectual Life," Philip Gilbert Hamerton, several decades ago, bears this testimony, "The profession of medicine is, of all fairly lucrative professions, the one best suited to the development of the intellectual life. Having to deal continually with science, being constantly engaged in following and observing the operation of natural laws, it produces a sense of the working of those laws, which prepares the mind for bold and original speculation, and a reliance upon their unfailing regularity which gives firmness and assurance.

"A medical education is the best possible preparation for philosophical pursuits, because it gives them a solid basis in the ascertainable.

"The estimation in which these studies are held is an accurate meter of the intellectual advancement of a community. When the priest is reverenced as being above ordinary humanity and the physician is lightly esteemed, the condition of society is sure to be that of comparative ignorance and barbarism."

The progress of society toward enlightenment is marked by the steady rise of the physician,—a rise which still continues in Western Europe.

"It is probable that before very long the medical profession will exercise a powerful influence upon general education and take an active interest in it.

"There are very strong reasons for the opinion that school-masters educated in medicine would be peculiarly well qualified to train both body and mind for a vigorous and active manhood."

Of this writer it is said by Charles Dudley Warner: "Few men have measured work or reputations with more sobriety of judgment, or made fewer mistakes in prophecy."

Certainly it does appear that a new era, long foretold, is

about to dawn for the education and consequent betterment of the world, in which our profession shall take no inconsiderable part. The change of opinion in the last few years is remarkable. There is activity and organization everywhere. Wisdom requires us to work along lines of least resistance and in ways that promise most permanent results.

The shortest path to the goal is that of legal enactment; the most permanent road is that of popular education.

Let me call your attention to the fact, however, that laws are rarely made until there is a popular demand for them, and are never enforced until the need for enforcement is felt.

We have decided to enter the field of politics. We have demanded legislation. We have asked recognition on important boards in which special training in sanitary science is of more value than military prowess or engineering skill. We have failed even to get a medical man on the Panama Canal Commission.

Why did the Crawford bill fail of passage in the Ohio Legislature? I charge ignorance, and not corruption. Members who voted were not properly informed of the true reasons for desiring its enactment into law. One of the best men in that Assembly, rather proud of his part in its defeat, acknowledged his humiliation and chagrin when his mind was opened to the urgent need of such legislation for the protection of the people and promised to vote right when the opportunity came again.

No adequate presentation of the bill was made. A doctor's simple request goes for nothing unless accompanied by cogent reasons which appeal to the legislators' sense of justice and right. What can we say of the outlook for the future? It is very encouraging and hopeful. The war against organized quackery is on. An organized profession will win. Editors, owners and publishers of newspapers and magazines are discerning the signs of the times and some of the higher class are denying space to patent medicine advertisers. They give public notice that they can no longer

be a party to false pretense and charlatanry. They denounce the whole nostrum business, and call upon good people everywhere to join in suppressing this great evil.

Another movement in the right direction is the disposition of school boards in this State to appoint medical supervisors of schools. When the 26,000 teachers in Ohio shall have such instruction as only a medical man can give on the dangers of the drug habit, and the fraudulent nature of proprietary medication, we shall see the beginning of the end of this nefarious business.

This great body of intelligent young men and women, properly instructed, will wield an influence for good which we cannot afford to ignore.

The Councilors should see to it that every teachers' institute and other associations of teachers, normal schools and normal colleges, and other institutions of learning, shall have judicious instruction on this subject.

We must educate, we must educate as the only means of defense for the public against imposition; the only means by which we shall secure the enactment and enforcement of law for our own and others protection.

By so doing we shall make use of a much-neglected factor, which will be useful in the solution of a perplexing problem.

Neglected Little Things

By R. S. Reid, M. D., Bucyrus

The advances made in medical science within the fifty years past have been so numerous and great that we have scarcely become accustomed to one new thing when another is upon us.

Hundreds of men and women are engaged in the effort to find some solution for the obstacles in the path of further scientific advance. With all our progress do we take advantage of the knowledge already in our possession; the little things in the way of hygiene, methods of diagnosis, and new

treatment, which add much to the safety and comfort of our patients and to our credit as physicians?

The majority of physicians know of these things in a general way, but be it said to our shame, this majority does not always put its knowledge into practice. The indictment is not that physicians are not skilled or learned enough, but that they are too careless to do things in the right way. A very small expenditure of time and money would make many an obscure case plain, and save the physician's reputation, if the simple methods of urinalysis, stomach lavage and the proper use of specula were as familiar in actual practice as they are in our minds.

Numerous physicians neglect a thorough examination of a patient until the family threatens a consultation or a change of doctors. The regular attendant immediately puts himself in possession of all the facts in the case and when the consultant arrives, the diagnosis is vindicated triumphantly. The patient might have fared better in health and pocketbook had this diagnosis developed earlier.

Someone is careless, almost criminally so, whenever typhoid fever is allowed to spread. In fact, we should have *no* typhoid if every physician would see to it that the urine and stools of his patients were thoroughly destroyed by sufficient chemical action (quicklime is cheap and efficient), or by fire.

Our cities are even worse, deliberately polluting a water-supply by means of very expensive sewage systems, and then furnishing this sewage, more or less diluted, to its inhabitants. Most of the older citizens become somewhat immune to this poison in time, but the mortality among the newcomers from the country districts is frightful. We will probably have long-winded discussions for years to come before proper filtration both of water-supply and sewage is established. One large lake city, owning the waterworks system, having an exhaustless supply of water at its door, instead of urging the freest possible use of water, and thus diluting the poison, put in meters at a cost of a half million dollars, so the water

would not be wasted. This economy has brought a large number of typhoid deaths, very possibly our late senator being among them.

In most of our small cities the sewage passes into small open streams, causing them to become an abomination to all along the bank in warm weather. Some 10 or 20 miles down the stream this water may be pumped into another city's supply pipes.

It is the duty of all physicians to make some study of the water-supply of their towns, so as to intelligently advise their patients concerning its usage. Wherever the water is bad, and with palpable faults, the doctor's influence should be constantly wielded in making public sentiment for pure water and proper sewage disposal. The larger the consumption of water *per capita,* other things being equal, the smaller the death-rate, and it is very poor economy to save water.

Nature intended water to be free as air and there should be no charge for the use of water for domestic purposes. Another instance of neglect is the epidemic of smallpox—more or less mild in type—that we have enjoyed for several years. Cuban itch may satisfy the patient's family, but it makes a very poor showing on the health report. Many towns have endeavored to keep quiet the fact that smallpox is prevalent in them, on the ground that it "hurts business." They pay dearly, later on, however, for this secrecy, as it allows the disease to spread so wide that publicity must come. Vigorously attack the first few cases, then there will not be so many expensive epidemics.

With most physicians indifferent, a few opposed to vaccination, and only a few urging it in a half-hearted way, is it any wonder that the public is indifferent also?

Another more serious disease, pulmonary tuberculosis—more serious because of the vast number attacked—has attained large proportions through our neglect in preaching and endeavoring to enforce the gospel of fresh air. How many take the trouble to make a careful physical examination when a patient presents himself with a "cold" of several

weeks duration. One thorough physical examination is worth much more—at least to the patient—than a half dozen microscopic examinations later; provided always, that the patient be placed on a proper régime. How many diagnose tuberculosis before the tubercle bacillus in the sputum practically signs his death warrant? Our sanitariums are demonstrating continually that the way to cure tuberculosis is to prevent it, and this is the business of the family physician.

The growth of the specialist has weakened the family doctor's influence somewhat in our cities, but he will always have a monopoly in the smaller towns and country. Do not think that these men are all ill-read and careless. Too many of them are, but so are some of their city brethren. You can see specimens of the best and worst type of doctors both in the city and country. All physicians have read, and know a great deal about asepsis and antisepsis, but do we always carry out our knowledge?

Ophthalmologists have seen eyes hopelessly infected through neglect of cleanliness in removing trivial foreign bodies from the eye. Too many have died from blood poisoning from a slight wound. Many a poor woman has died from puerperal sepsis, through her trusted attendant's lack of asepsis at the proper time. The New York Maternity has demonstrated that even with all possible precautions infection may occur, yet the patient should receive due care and attention, and if the worst should come the doctor has less with which to reproach himself. Fourth-of-July accidents have been exceedingly fatal through lack of thoroughness in the initial dressing. It would seem better to cause a little extra suffering in 10 patients, than to lose one from the terrible tetanus.

We have all seen physicians attending cases that are contagious, and passing from one patient to the next without any precautions being taken. Too few physicians refuse obstetric and surgical calls when they know they are handling violently infectious diseases or pus cases.

How often do we hear in this or that case of diphtheria

that "antitoxin" has been used as a last resort? Why *last?* Also why do we find so many cases develop diphtheria that have been exposed to "malignant" or "putrid" sore throat, or tonsillitis?

After all, the physician must use not only the knowledge taught him at school and by his books, but also that which his reason—his common sense—tells him is right.

Specialists? We need them very much but the great mass of people need the general practitioner more; yet he must be a specialist in everything to the extent that he may know the limit of his skill, and be able to send for expert assistance at the proper time.

Nervous Phenomena and Local Disease—The Question of Surgical Intervention

By Edward S. Stevens, M. D., Lebanon

When wee Willie Winkie started up the stairs he stopped, gained the attention of his elders, stamped his wee foot, and exclaimed with emphasis, "I'm bad!" His father agreed with him and thought that a spanking was what wee Willie was looking for. But the mother, who had watched over and cared for the boy almost constantly during the three years of his life, realizing that the child's disposition had been sweet and lovable until very recently, looked troubled and suggested calling the doctor; and she had her way. Several physicians were called before it was discovered that the medicines given to control a developing chorea were temporary in their effect, and even then not entirely satisfactory. When one of the physicians visited the child just as he was being aroused from sleep and noticed certain almost involuntary movements on the part of the half-awake child, he suggested that an examination might show that there was trouble with his genital organs. Not only was this the case, but the freeing of the prepuce, which was adherent over half the glans, was sufficient, without cir-

cumcision, to cure the chorea and other nervous symptoms, and to restore the former sweetness of disposition. As long as the toilet of the part was properly attended to the cure was permanent; neglected, the symptoms returned. It may be added just here that certain movements of the child pointing to local trouble, and its reflex sequences, were first noticed shortly after wee Willie's mother in pinning his diaper had thrust a safety pin through the prepuce.

It is difficult to explain why in one person such a morbid condition will give rise to serious symptoms, while in some one else a more extensive disease of the same character produces no discomfort of any kind. This is illustrated in the case of Mr B., a man whose prepuce for several years has been becoming more and more adherent. Because it has not troubled him he sought advice only after the meatus was so completely covered that the urine came away at first slowly in drops, and then ceased to pass.

Again, Mrs M. consulted her physician a number of times for gastric distress with flatulence before it was discovered that the belching and other gastric symptoms always accompanied a profuse leukorrhea. An examination revealed a laceration of the cervix of rather slight extent, yet with its repair the stomach ceased to trouble her and her general health improved, as was shown by a gain in weight of an average of a pound a week for the next three months.

On the other hand, Mrs L. had nothing more than some slight local distress, although her uterus was prolapsed, and the cervix very much enlarged and torn bilaterally for more than an inch.

It has been suggested by some one who has given much attention to ocular disturbances that it is the slighter degrees of errors of refraction and accommodation frequently which give rise to the more annoying reflex troubles. If this is true, still it does not explain why it is so.

Let it be understood at the outset that the term "surgical intervention" does not always mean the performance of some grave operation. It was not an operation of any

moment at all that gave wee Willie Winkie relief. It may even refer to the adjustment of some helpful appliance.

One aspect of this question is so generally accepted that even the school children realize that headaches are cured by wearing properly fitted glasses. In many a community there is some one who sees in the elongated prepuce with contracted orifice, with or without adhesions, the cause of any ailment a boy may have. Sometimes defective vision *is* the cause of headache; sometimes the redundant prepuce *is* the point of origin of some nervous manifestation—but often they are not. When this subject is considered as it must be, not only will there be much less empiricism in these commonly discussed cases, but it is to be hoped that the idea of reflex disturbances will have a wider range of application generally among physicians than is the case. When this time comes perhaps fewer cases of floating kidney and chronic appendicitis will be treated by the administration of bismuth, drugs to assist digestion, and anodynes, because of the presence of symptoms apparently pointing to what has been supposed to be an attack of indigestion.

A few examples of reflex pain might be given which would at once suggest that the pain of which complaint was made referred to disease in some distant part, and that the disease was essentially one requiring the services of a surgeon. Thus, if one's attention is called to continued pain at the knee he at once looks for other signs of hip-joint disease. It is at once classed as probably a surgical case requiring the skill of the orthopedic surgeon. Or, pain in the end of the penis suggests almost at once the probability of stone in the kidney or bladder. These are everyday experiences. Other phenomena concern the functional activity of various organs, and disturbances of motion in one way or another. These are less often looked upon than is pain as indicative of some local disorder requiring the services of the surgeon. Yet numbers of cases might be cited to illustrate the fact that these disturbances are purely

reflex, and that their cessation depends upon the cure of the distant local trouble.

Without taking the time to relate specific histories, it may be said that there are many cases of peritoneal adhesions which give evidence of the morbid condition present rather by signs in some part remote from the seat of disease than in the immediate neighborhood of the adhesions. Few of these cases are clear at the first interview, and many of them are recognized only after prolonged watching.

Because of the first point to which allusion has been made, namely, that the only visible morbid condition discovered is slight in comparison to others which give rise to no apparent trouble, it is rather too often passed by as having no connection with the case requiring attention. Indeed, some of the teachers to whom we have loved to look as authorities in their special work have gone so far as to doubt the frequent existence of symptoms requiring local attention after such accidents, let us say, as the slighter cervical tears. Because a man of great general and special experience has not met with or recognized a condition is hardly conclusive evidence that it has no existence.

When it comes to the class of cases represented by peritoneal adhesions several difficulties may be encountered. He is a wise man who can resist the impulse to make an immediate diagnosis, and yet his first difficulty may be the demand of his patient to do this very thing. It may be that the previous history cannot be obtained in any such form as to be of value, and yet if there are peritoneal adhesions there has been peritonitis. With no present local trouble to which the sufferer calls one's attention, with a previous history of some disease of apparently slight severity and at a remote date, and with such symptoms, let us say, as aphonia, and convulsions in connection with disease of the region of the gall-bladder, is it to be wondered at if the physician fails at first to realize the exact condition with which he has to deal, or is he to be censured if, perhaps, he fails utterly in his diagnosis? I think not.

In many of these cases the rather cruel error is committed of calling the case one of hysteria and letting it go at that. This is done without making a diagnosis of hysteria at all as a disease. It is rather with the sometimes accepted notion that there is nothing much the matter at all. Mrs Dombey was told by her dear sister-in-law that she must "rouse herself," and "make an effort." But Mrs Dombey died.

There are two sides to this question. All diseases of the nervous system accompanied by local morbid conditions are not necessarily due to the local disorder, nor cured by the relief of the local trouble. Some diseases of the nervous system which seem to have had their origin in local disease are not immediately cured by attention to the original local cause, nor, perhaps, even at all relieved by local treatment exclusively.

When one hears of such remarkable cures as that of severe epilepsy by resorting to some surgical operation he would better take two times to think it over. There may have been convulsions, but it may not have been epilepsy. Or the operation, whatever it may be, may have put an end to the epileptic attacks temporarily; a little period of waiting may prove the fallacy of the supposed cure. Let us remember that almost any operation or accident will, likely, be followed by less frequent convulsions in this disease for a longer or shorter interval.

The points to which attention may be profitably directed at this time are, first, the necessity of patience, and care, and unlimited time—months, if necessary, being expended in making as nearly an exact diagnosis as possible; and second, that when there seems reasonable ground for the belief that some connection exists between some local disease of a kind to be benefited by a surgical procedure, and nervous phenomena of greater or less severity, the sufferer should be given the benefit of the procedure—the operation, or application, or fitting of some helpful instrument, or whatever it be—without reference to the apparent immediate effect upon the nervous exhibition.

Radium and Radioactivity

By Myron Metzenbaum, B. S., M. D., Cleveland

Assistant in the Department of Anatomy of the Cleveland College of Physicians and Surgeons

In 1895 Prof. Roentgen, of the University of Wurzburg, Germany, discovered that if solid bodies be placed between a fluoroscope and the rays coming from a Crooks tube, it could be seen that these rays passed through some opaque bodies and gave outlines of denser bodies. The interpretation of this meant that these rays, called the X-rays, were capable of penetrating some opaque bodies. This newly-discovered action of the X-rays opened a new field to the scientists and turned their attention to the seeking of new forms of light and new properties and actions of light. The greatest activity was directed to the study of phosphorescent, violet and ultra-violet rays.

In February, 1896, M. Henry, of Paris, announced that phosphorescent zinc sulphid was capable of affecting a photographic plate when the same was first covered with black paper. Soon thereafter Prof. H. Becquerel, of the Institute of France, who was making a thorough investigation of all so-called phosphorescent substances, discovered that if the crystals of the various uranium salts be placed on a photographic plate first covered with black paper that it was not necessary to expose the plate to the sunlight but even when kept in the dark the plate was affected underneath the crystals. Furthering these researches Madam Curie, assisted by her husband Prof. M. Curie, found that the waste product of the pitchblend from which radium is extracted affected a photographic plate more readily than did either the uranium salts or the pitchblend itself and also that this waste product was capable of discharging the leaves of a charged electroscope more rapidly than either the uranium salts or the pitchblend itself. From this they rightly concluded that the waste product must contain something more than either the uranium salts or the pitchblend.

In 1898, after two years of experimenting, the Curies succeeded, by the method of fractional crystallization, in extracting from this waste product of pitchblend a very active substance which they called polonium and soon thereafter a second new substance which they called. radium. For these discoveries the Royal Academy of Stockholm awarded to M. Becquerel, M. and Madam Curie conjointly the Noble Prize of 100,000 crowns ($28,000), as being a most important contribution to physics and chemistry for the year 1903. All substances which emit rays of light that are capable of affecting a photographic plate through black paper and of discharging an electroscope are said to possess Becquerel rays and to be radioactive.

Radioactivity: The rapidity with which pure metallic uranium discharges an electroscope is taken as a unit or one. The relative rapidity with which any other substance discharges an electroscope is known as the radioactivity of that particular substance. All products of radium, thorium, uranium, and as I will show later, zirconium and yttrium, possess this power of discharging an electroscope. Certain specimens of radium have an activity of 1,800,000.

Investigation: Following along the line of work suggested by Prof. Becquerel I took sensitive photographic plates, covered them with black paper and on the paper placed a flat object, generally a key, and around the object sprinkled the powdered crystals of the various uranium salts. Each plate was then placed in a triple photographic plate box, each box enclosed in a cigar box and placed in a cupboard in my photographic dark-room. Thus all possibilities for the action of sunlight on these plates was absolutely excluded. After 36 to 120 hours these various uranium salts produced a definite action on the plates. Each experiment was repeated at least twice and many as often as ten times under exactly the same conditions, using the same substances in exactly the same quantities, and allowing the same length of time.

That this action on a photographic plate is not a chemical action but is due to the so-called Becquerel rays emitted from these substances is inferred from the facts that the crystals were separated from the film of the plate by black paper, a plate of glass or bone placed on top of the black paper, or by suspending the crystals on a plate of glass at a distance up to two inches above the covered photographic plate, or by placing the crystals on the reverse side of the photographic plate.

Space will not permit giving the details of the experiments, a full report of which appeared in the *Cleveland Medical Journal* for May, 1904.

Summary: Summarizing the results of 15 typical experiments we may draw the following conclusions: that the various uranium salts are capable of affecting a photographic plate without the aid of the direct sun rays; that these rays can penetrate black paper, aluminum, bone, and glass; that they can act at a distance of several inches. At a distance of one inch it required about twice the length of time for the rays to act as compared with their action when only separated from the photographic plate by black paper.

The radioactivity as exhibited in the uranium products, I believe is due to the fact that uranium is derived from the same crude product as radium and that it possesses none of these properties itself, but probably contains very minute quantities of radium.

Thorium Series: All the experiments performed with thorium are the exact duplicates of those performed with uranium and in all respects the results obtained are the same, except that some thorium products affect a photographic plate with greater rapidity than some of the uranium products I have examined and with less rapidity than others.

Conclusions: From these experiments it can be concluded that the Becquerel rays of thorium are capable of affecting photographic plates in the dark without the aid of sunlight; that they can penetrate black paper, alumium, bone and glass, and at a distance of one inch it requires

about twice the length of time it would if it were only separated from the photographic plate by black paper. This radioactivity of thorium is most probably due to minute quantity of radium which it contains.

In the investigation of many substances belonging to the same class as thorium as to their action on photographic plates in the dark, I now wish to report two substances which have hitherto not been reported as having this property, and which are capable of discharging an electroscope, the first, zirconium and its salts, and the second, yttrium.

In repeated experiments with zirconium, it seems to affect the photographic plate in less time than any preparation of thorium I have thus far obtained, and it is possible that zirconium may even be shown to be more radioactive than thorium which is said to possess the greatest radioactivity of any known substance next to radium itself.

Radium: Radium is obtained chiefly from the pitchblend found at Joachimsthal, Bohemia. It comes in hermetically-sealed tubes for it absorbs moisture from the atmosphere. Its atomic weight as determined by Madam Curie is 225. It readily affects a photographic plate. Radium of high activity penetrates very dense bodies and when placed in front of the closed eyelid there appears a very peculiar brilliant light. When placed back of the ordinary X-ray or fluoroscope screen there appears a rather bright area.

Radium gives out both light and heat without apparently losing any of its weight or power; as this seems in contradistinction to the law of the conservation of energy it has aroused unusual interest in the scientific world, and in explanation of this action two plausible theories have been advanced:

The first theory is that radium has a very large molecule, since its atomic weight is 225, and that its molecules are continuously breaking up into smaller particles, namely into ions or electrons, and it is because of these continuous

charge in the molecules themselves that radium emits light and heat.

[illegible] to confirm this theory by a small instrument he has constructed called the "Spinthariscope." This instrument consists of a small [illegible] screen back of which is mounted a small particle of radium. When you look through a lens at the screen in the dark, there is seen what appear to be brilliant flashes in the various parts of the screen. At times very brilliant flashes of the silvery flashes seen appear during a short interval of time. These flashes are supposed to be caused by the ions striking up against the screen.

The atomic theory is one in which it is supposed that radium is capable of storing or absorbing some form of penetrating energy and of converting the same into the ordinary light and heat. As bearing on this theory the following may be offered. Took some polysulphid of calcium and mixed this with varnish and with this painted the inside of a test-tube. This is generally known as Sidnicus paint. This tube was then exposed to sunlight which rendered it phosphorescent. It was then suspended from the under surface of a light-tight screen, and in the bottom of the box was placed a bare photographic plate on which several objects were laid. The box was kept in a drawer in the dark-room and after seven days very definite outlines of the objects were obtained. This same tube was kept continuously in the dark for six weeks, after which time it affected a photographic plate in three days.

If zinc sulphid be rendered phosphorescent by exposing it to the sunlight, or if the calcium sulphid be exposed near burning magnesia, both these substances will then likewise affect a photographic plate for a long time. These substances do not discharge an electroscope and are only phosphorescent but not radioactive.

Induced Radioactivity: It has been stated that if sealed tubes containing radium be suspended in salt solutions and solutions containing various drugs, that these solutions

became radioactive and would affect a photographic plate and also that they possessed therapeutic properties. Bearing on this subject I conducted nearly 100 experiments in which tubes of radium of low and up to 1,000,000 activity were suspended in various solutions and in various powders such as quinin and bismuth for as long as 10 days. These solutions were then placed in very thin vials and strapped directly against the film of photographic plates, and the powders were placed directly on the photographic plate and allowed to remain there for as long as 21 days, but in no instance did they show the slightest effect on the plate, nor was it possible to show this supposed induced radioactivity by means of an electroscope.

Aluminum: When the supposed radioactive solutions were placed in very thin aluminum boxes and these boxes placed directly on the film of a photographic plate, it was seen that in each case the plate was affected only at the points of contact of the box. This was at first thought to be due to the radioactivity of the solutions.

The summary of many experiments shows that the action of these aluminum boxes on the photographic plates does not depend on the supposed radioactive solutions they contained, for empty aluminum boxes and all sorts of aluminum articles when placed in direct contact with the film of the plate will affect the photographic plate at the points of contact in from 40 to 120 hours. Metallic aluminum has no action on photographic plates when it is separated from the film by paper or glass or when placed on the reverse side of the plate, nor does it show any action on the electroscope. This effect on photographic plates is probably either a chemical or electrical action between the albuminate of silver of the plate and the metal. This observation that when metallic aluminum is placed directly on a bare photographic plate produces its own image has not heretofore been pointed out.

From these experiments on induced radioactivity and aluminum, the full details of which are reported in the *Scientific American* of May 14, 1904, we can conclude that

by suspending tubes of radium of various strengths for long periods in various solutions and various powders that neither the solutions nor the powders are rendered radioactive.

Therapeutic Value of Radium: The therapeutic value of radium seems to be limited to the treatment of lupus and rodent ulcer, for up to the present time there is possibly no creditable report wherein radium has shown any favorable effect in the treatment of malignant growths, and even the seemingly favorable results obtained in lupus have not stood the test of sufficient time, for we know that lupus may be healed for a number of years and then the disease reassert itself.

Bearing on this subject I now wish to present to you Mrs D., aged 57. Seventeen months ago she had a beginning lupus starting in the middle of the right super orbital ridge. On the application of the X-rays it improved. Then the eye itself became involved to such an extent that it was necessary to remove it nine months ago. While the wound from the operation was healing the X-rays had to be discontinued for a period of six weeks, during which time the disease spread. Further application of the X-rays caused the center to heal while the ulcerated area spread rapidly at the periphery.

The patient was referred to me by Dr Russell H. Birge on April 7. At this time there was a round healed area 1½ centimeters in diameter. Around this was an ulcerated rim varying in width from 1½ to 2 centimeters and extending from the outer corner of the eye to within 1½ centimeters of the ear and well down on the cheek. This entire area was deeply congested and in but a few places was there any skin. I applied a tube of radium of 7000 activity and two tubes of radium of 40 activity for 35 minutes every three days. After the second treatment much of the congestion disappeared and the edges as well as the base took on a better appearance and much of the deep seated pain had left. From this time improvement was very rapid, and now after 45 days you see that about three-fourths of the

entire ulcerated area has become firm white scar tissue. Even with so much apparent healing many months, even several years, must elapse in order to see whether the deep seated germs will not assert themselves again, before the case can be pronounced as cured.

Photograph taken 40 days from the beginning of the treatment. At this time three-fourths of the entire ulcerated area has become firm white scar tissue.

At the present time I have under treatment two other cases of lupus, one of which has been treated for many years by various methods, including actual cauterization as well as the X-rays, and both of these cases are improving most rapidly under the treatment of radium.

It was thought that radium might be used similar to the X-rays in obtaining skiagraphs of the bones, but the rays

of radium penetrate the bone quite as easily as they do the flesh, and it requires at least 24 hours, using a tube of radium of high activity, to obtain an outline of the bones, during which time the rays will have caused a very severe irritation to the exposed area.

X-ray picture of false joint, showing the ends of the fragments. Three-minute exposure.

Radium picture. Tube of 15 grain Radium 40 activity suspended one w above bone which was placed on a b photographic plate.

The two figures of false joint of the ulna (which is reported in the *Cleveland Medical Journal,* April, 1904) give very good example of the comparative value of the X-rays and radium in the examination of bones directly.

The first figure is an X-ray of the bone itself after a three-minute exposure. In the second figure the bone was fastened directly on the bare photographic plate and a tube of 15 grains of radium of 40 activity was suspended directly above it for one week. The rays have but slightly penetrated the connected tissue between the ends of the two bones. When tubes of radium of high activity were suspended above this same bone for a period of two weeks it did not show a differentiation between the fibrous tissue and the solid bone.

CHAPTER VIII

Registered Physicians at the Cleveland Meeting of the Ohio State Medical Association,

May 18, 19 and 20, 1904

Academy of Medicine of Cleveland:

Alden, Eliot, Lennox Bldg.
Aldrich, Chas. J., 612 Prospect St.
Allen, Dudley P.
Baker, A. R.
Ballard, Homer C.
Barger, W. T.
Bauman, George I.
Biggar, H. J., Jr.
Birge, R. H.
Black, J. F.
Bliss, H. C.
Boggs, Jessie
Bourne, E. L., Brecksville.
Bretz, I. S.
Briggs, C. E.
Brokaw, W. F.
Brown, E. E.
Brown, N. Worth
*Bruner, William E.
*Bunts, Frank E.
Campbell, A. D.
Carter, Edward P.
Chamberlain, William B.
Childs, L. W.
Clapp, Harold T.
Clark, Frank S.
Clark, William
Clarke, Thomas W.
Coates, Benj. O.
Cobb, Percy W.
Colver, Caroline B.
Cook, Joseph E.
Coplan, M.
Corlett, William T.
Crowell, William S.
Darby, John C.
Davis, F. W.
Dickinson, John, Jr.
Dolley, D. H.
Doolittle, W. F.
Dutton, C. F.
Dye, J. H.
Farnsworth, George B.
Foote, Charles G.
Ford, Clyde E.
Friedrich, Martin
Friend, John M.
Gernhard, W. E.
Gill, William C.
Goodwin, E. M., Glenville
Hamann, Carl A.
Hannum, E. H.

*Delegate.

Academy of Medicine of Cleveland—Continued.

Hanson, D. S.
Hartzell, H. J.
Haskins, H. D.
Hay, C. H.
Heidler, G. K.
Heimlich, D.
Hendry, William
Herrick, F. C.
Herrick, H. J.
Hickin, F. W.
Hill, W. C.
Hobson, J. F., Lakewood
Hobson, Joseph F.
Hobson, Willis S.
Hole, C. M.
Holmes, George
Hosick, William A.
House, A. F.
Howard, A. B.
Howard, W. T., Jr.
Howland, A. P.
Humiston, William H.
Hutchins, F. C.
Iddings, George S.
Jenkins, A. A.
Jones, J. Arthur
Jones, N. M.
Kahn, Max
Kelley, J. F.
Kelley, S. W.
Klaus, M. H.
Knowlton, W. A.
Kopfstein, F. T.
Kurtz, H. B.
Ladd, L. W.
Large, S. H.
Lauder, Edward
Lawlor, R. J.
Lee, H. J.
LeFevre, W. I.
Lemon, W. L.
Lenker, J. N.
Lichty, M. J.
Lincoln, Walter
Lincoln, William
Lowman, John H.
Lower, William E.
Luck, Henry C.
Mabley, H. C.
Macleod, J. J. R.
Manning, W. J.
Martin, Thomas Charles
Marvin, A. H.
McBride, J. Lillian
McCune, F. K.
McPeck, E. E.
Merriam, W. H.
Metzenbaum, Myron
Mizer, T. J.
Moore, J. M.
*Moorehouse, G. W.
Morton, F. J.
Nash, A. C., Glenville
Nungesser, J. J.
Oakley, Frank
Ormsby, William O.
Osborn, William O.
Oster, L. W.
Paulin, N. O.
Perkins, R. G.
Powell, Hunter H.
Povey, W. G.
Pressey, A. J.
Rayl, W. L.
Richardson, W. H.
Riley, J. A.
Robb, Hunter H.
Rogers, H. W.
*Rosenwasser, Marcus
Rosenberg, E.
Rosewater, Nathan
Roth, Frank

*Delegate.

Academy of Medicine of Cleveland—Continued.

Ruedy, Robert E.
Sager, B. E.
Sanford, H. L.
Sawyer, John P.
Schnee, R. G.
Schmoldt, F. J.
Scott, N. Stone
Schultz, O. T.
Scully, A. P.
Season, E. H.
Selby, C. D.
Sherman, H. G.
Skeel, R. E.
Smith, D. B.
Smith, Geo. S.
Somerville, G. H.
Soyer, G. P.
Spence, H. L.
Spenzer, John G.
Spurney, A. F.
Stepp, Morris D.
Stern, Walter G.
Sunkle, R. H.
Taylor, F. C.
Thomas, J. J.
Thomas, O. T.
Tierney, J. S.
Towslee, L. G.
Tuckerman, J. E.
Updegraff, R. K.
Upson, George D.
Upson, Henry S.
Walker, C. S.
Waugh, J. M.
Weber, J. H.
Weber, W. C.
Webster, S. J.
Wedler, C. R.
Weir, William H.
Wheelock, L. A.
Whitslar, W. H.
Williams, T. B.
Wood, John S., Collinwood
Woodford, E. W.
Young, H. A.

Allen County:
*Rudy, A. S., Lima.
Steiner, D. W., Lima.

Ashtabula County:
*Case, F. D., Ashtabula.
Dickson, J. A., Ashtabula.
Ellsworth, W. O., Austinburg.
Fox, C. L., Kingsville.
Pomeroy, A. L., Windsor.
Tower, B. M., Conneaut.

Belmont County:
*Cope, E. C., Barton.
Hobson, J. A., Flushing.

Brown County:
*Stephenson, Young, Georgetown.

Butler County:
Hermann, G. A., Hamilton.
*Millikin, Mark, Hamilton.

Carroll County:
Hathaway, J. J., Carrollton.
*Spratt, W. R., Malvern.
Whiteleather, T. N. B., Malvern.

Champaign County:
Houser, D. C., Millerstown.

Cincinnati Academy of Medicine:
Bailey, G. L.
Beebe, Brooks F.
*Bonifield, C. L.
*Brown, Mark A.
Carothers, Robert
Cone, S. E.
Cross, Frank B.
Dandridge, N. P.

*Delegate.

Cincinnati Academy of Medicine—Continued.

Fackler, G. A.
Greene, M. D.
Hall, R. B.
*Kramer, S. P.
Lamb, Frank H., Glendale.
Mitchell, E. W.
*Reed, Charles A. L.
*Schwab, Louis
Thompson, J. A.
Whitacre, H. J.

Clark County:

*Anzinger, F. P., Springfield.
Link, J. A., Springfield.
Titlow, B. D., Springfield.

Clinton County:

*Trimble, R. T., New Vienna.

Columbiana County:

Anderson, James, Salem.
Bookwalter, Harry, Columbiana.
Calvin, H. M., Salineville.
Elliott, J. T., E. Liverpool.
Graham, F., Lisbon.
Herbert, J. L., Hanoverton.
*Hobbs, W. A., E. Liverpool.
Hulin, O. W., Greenford.
Johnston, C. E., E. Palestine.
McCready, S. R., Leetonia.
Moon, F. P., Lisbon.
Morris, William E., Lisbon.

Columbus Academy of Medicine:

Baldwin, J. F.
Blake, F. W.
Clemmer, J. W.
Coleman, N. R.
Deuschle, W. D.
Dunham, John D.
Hamilton, C. S.

Columbus Academy of Medicine—Continued.

Jones, H. S.
Kidd, R. A., Shepard.
Kinsman, D. N.
Lawrence, F. F.
Means, W. J.
*Moore, D. L.
Nessley, G. B., Grove City.
Ranchous, W. E. M.
Rankin, T. W.
Reason, J. W., Hilliards.
Rodebaugh, H. A.
Shriner, P. D.
Stein, G. S.
Tarbell, R. C.
Teachnor, Wells
Thomas, J. M.
Upham, J. H. J.
Waters, G. M.
Winders, Frank
Wolfe, A. C.
Youmans, T. G.

Coshocton County:

*Lower, J. D., Bakersville.
McLain, Jesse, Coshocton.
Shumaker, D. W., N. Bedford.

Crawford County:

Rayl, K. J., Galion.
Reid, R. S., Bucyrus.
Starner, A. A., Galion.
Trimble, C. E., Crestline.

Delaware County:

Chidester, C. W., Delaware.

Erie County:

Cook, Alta F., Sandusky.
*Graefe, Charles, Sandusky.
Merz, Charles H., Sandusky.

*Delegate.

Fulton County:
Blair, Thomas, Lyons.

Gallia County:
*Holmes, Ralph W., Gallipolis.
Ohlmacher, A. P., Gallipolis.

Geauga County:
Pomeroy, Frank S., Chardon.
Schwartz, M. F., Auburn.

Greene County:
*Grube, R. H., Grape Grove.
McClellan, B. R., Xenia.

Guernsey County:
*Bradford, William N., Cambridge.
Lane, F. W., Cambridge.

Hancock County:
Hersh, E. G., McComb.
Tritch, J. C., Findlay.

Hardin County:
Bain, Frank D., Kenton.
*Protzman, E. S., Kenton.

Harrison County:
West, J. D., Hopedale.

Henry County:
Harrison, Frank M., Napoleon.
Maerker, A. E. H., Napoleon.

Highland County:
*Larkin, J. C., Hillsboro.

Hocking County:
*Smith, A. K., Logan.

Holmes County:
Wise, R. C., Millersburg.

Huron County:
Pilkey, B. C., Monroeville.
Young, D. E., Wakeman.
(No Society in Huron Co.)

Jackson County:
Sylvester, John E., Wellston.

Jefferson County:
Floyd, J. C. M., Steubenville.
Rea, E. H., Irondale.
Robertson, Joseph, Steubenville.
*Wood, William H., Smithfield.

Knox County:
*Larimore, F. C., Mt. Vernon.
Lee, James F., Mt. Vernon.
*Pennell, W. W., Mt. Vernon.

Lake County:
Quayle, C. H., Madison.

Lawrence County:
Keller, Lester, Ironton.
*Marting, William F., Ironton.

Licking County:
Barnes, B. F., Newark.
*King, C. P., Newark.

Logan County:
Deemy, J. S., Bellefontaine.
*Huston, C. E., Rushsylvania.
Morgenroth, S., Bellefontaine.

Lorain County:
Brown, E. O. S., Lorain.
*Cameron, E., Lorain.
Cushing, C. H., Elyria.
Dager, W. F., Lorain.
Garver, A. F., Lorain.
Garver, C. V., Lorain.
Hart, Wm. E., Elyria.
Hubbell, William B., Elyria.
Hug, E. V., Lorain.
Maynard, O. T., Elyria.
Webster, A. M., Lorain.

*Delegate.

Madison County:
*Rogers, A., W. Jefferson.

Mahoning County:
Montgomery, R. H., Youngstown.

Marion County:
Adair, J. W., Marion.

Medina County:
Everhard, N. S., Wadsworth.
Jones, Frank S., Medina.
Murray, L. S., Medina.
Wise, W. D., Medina.

Miami County:
Burnham, R. D., Piqua.
Caywood, J. R., Piqua.
Miller, A. C., Covington.
*Thompson, W. R., Troy.
Tydings, O., Piqua.
Wright, Thomas M., Troy.

Montgomery County:
Barker, F. D., Dayton.
Beck, John S., Dayton.
Bonner, Horace, Dayton.
Conklin, D. B., Dayton.
Conklin, W. J., Dayton.
*Evans, G. B., Dayton.
*Goodhue, George, Dayton.
Hill, E. L., Dayton.
Howell, J. M., Dayton.
Patterson, C. L., Dayton.
Weaver, J. M., Dayton.

Muskingum County:
Higgins, Charles H., Sonora.
Melick, W. A., Zanesville.

Ottawa County:
Heller, F. S., Oak Harbor.
Pool, H. J., Port Clinton.

Paulding County:
*Brattain, G. M., Antwerp.
Cartwright, J. W., Payne.
Clark, E. A., Paulding.

Pike County:
Andre, O. C., Waverly.
*Mooney, C. M., Waverly.

Preble County:
Christian, W. I., Verona.
*McQueen, D. W., Camden.
Sater, P. M., Gratis.

Putnam County:
*Beardsley, C. E., Ottawa.
Hickey, W. D., Leipsic.

Richland County:
Findley, S. E., Mansfield.
*Hedges, J. S., Mansfield.
McCullough, A. H., Mansfield.

Sandusky County:
Ickes, E. M., Fremont.
Phillips, M. O., Fremont.
Stamm, Martin, Fremont.
Stephens, C. A., Helena.

Scioto County:
Berndt, D. B., Portsmouth.
Clark, H. F., Rarden.
Halderman, S. S., Portsmouth.
*Rardin, J. S., Portsmouth.

Seneca County:
Anders, C. I., Old Fort.
Benner, C. T., Tiffin.
*Gibbon, H. B., Tiffin.
Hendershott, R. R., Tiffin.
Steele, R. G., Melmore.

Shelby County:
*Costolo, J. M., Licking.
Silver, D. R., Sidney.

*Delegate.

Stark County:
Barnes, S. S. P., Massillon.
Bauer, M. M., Lake.
Brant, A. C., Canton.
Corl, H. E., Middlebranch.
Culbertson, A. M., Massillon.
DeWitt, J. P., Canton.
Dudley, S. B., Canton.
Folk, E. S., Canton.
Gans, D. W., Massillon.
Gardner, D. S., Massillon.
Gavin, F. W., Canton.
Kahler, J. F., Canton.
Marchand, J. F., Canton.
*Miller, T. C., Massillon.
Myers, E. G., Canton.
Post, L. B., Canton.
Pumphrey, R. J., Massillon.
Reed, T. J., Massillon.
Santee, L. B., Marlboro.
Schuffell, H. M., Canton.
Schultz, C. F., Canton.
Smith, M., Massillon.
Steele, W. C., New Berlin.
Talmage, E., Canton.
Temple, J. C., Alliance.
Tressel, J. K., Alliance.
Walker, A. B., Canton.

Summit County:
*Bowman, D. S., Akron.
Cozad, H. I., Akron.
Davidson, H. S., Barberton.
Fouser, A. K., Akron.
Held, C. E., Akron.
Hiddleson, C. S., Akron.
Jackson, T. W., Akron.
Jacobs, H. H., Akron.
Jacobs, W. C., Akron.
Lewis, D. H., Akron.
Mather, E. L., Akron.
McDonald, D. M., Akron.

Summit County—Continued.
Norris, C. E., Akron.
Searl, William A., Cuyahoga Falls.
Stevenson, M. D., Akron.
Taggart, H. D., Akron.
Weaver, E. M., Akron.

Toledo and Lucas County Academy:
Chapman, W. C., Toledo.
Donnelly, James, Toledo.
Duncan, James A., Toledo.
Foster, S. D., Toledo.
Fox, J. F., Toledo.
Gillette, William J., Toledo.
Harpster, C. M., Toledo.
Heath, H. H., Toledo.
Hubbard, Thomas, Toledo.
Imoberstag, C. O., Toledo.
Jacobson, J. H., Toledo.
Keller, T. F., Toledo.
Myers, Park L., Toledo.
Smead, H. E., Toledo.
Smith, Anna G., Toledo.
Thorn, S. S., Toledo.
Wagar, C. P., Toledo.
Woods, Elizabeth, Toledo.

Trumbull County:
Button, W. H., Hubbard.
Hoover, D. E., Warren.
Leland, L. G., Newton Falls.
Minich, G. E., W. Farmington.
Rice, C. M., Newton Falls.
Root, H. D., Kinsman.
Sabin, T. M., Warren.
Smith, F. K., Warren.
Williams, C. C., Niles.

Tuscarawas County:
Brannan, T. H., Canal Dover.
*Groves, J. E., Uhrichsville.
Hosick, W. R., New Comerstown.
Kistler, G. B., New Comerstown.
Sawyer, C. H., Mineral City.

*Delegate.

Union County:
Mills, C. D., Marysville.

Vinton County:
*Moore, W. R., Vinton.

Warren County:
Stevens, E. S., Lebanon.

Washington County:
Bohl, Jacob, Marietta.
Smith, A. Howard, Marietta.

Williams County:
*Pugh, F. H., Bryan.
Weitz, J. A., Montpelier.

Wood County:
Alford, J. B., Grand Rapids.

*Delegate.

Component Societies*

Adams—Pres't, J. W. Bunn, West Union; Sec'y, A. T. Sproull, West Union.

Allen—Pres't, T. R. Terwilliger, Lima; Sec'y, G. A. Bachmayer, Lima.

Athens—Pres't, Chas. S. McDougal, Athens; Sec'y, U. P. White, Athens.

Belmont—Pres't, E. C. Cope, Barton; Sec'y, James P. McClellan, Bellaire.

Brown—Pres't, A. W. Mitchell, Georgetown; Sec'y, R. B. Hannah, Georgetown.

Butler—Pres't, A. L. Smedley, Hamilton; Sec'y, Mark Millikin, Hamilton.

Carroll—Pres't, J. R. Williams, Carrollton; Sec'y, J. J. Hathaway, Carrollton.

Champaign—Pres't, E. W. Ludlow, Urbana; Sec'y, M. L. Smith, Urbana.

Clark—Pres't, E. C. Harris, Springfield; Sec'y, F. P. Anzinger, Springfield.

Clermont—Pres't, F. C. Curry, Milford; Sec'y, E. C. Ireton, Marathon.

Clinton—Pres't, Allen T. Quinn, Wilmington; Sec'y, E. C. Briggs, Wilmington.

Columbiana—Pres't, Wm. Moore, Lisbon; Sec'y, W. E. Morris, Lisbon.

Coshocton—Pres't, R. C. Edwards, Coshocton; Sec'y, J. D. Lower, Coshocton.

Crawford—Pres't, C. E. Trimble, Crestline; Sec'y, E. D. Helfrich, Crestline.

Cuyahoga—The Cleveland Academy of Medicine—Pres't, Geo. W. Crile, Cleveland; Sec'y, Edward Lauder, Cleveland.

Darke—Pres't, John B. Ballinger, Bradford; Sec'y, John M. Anderson, Greenville.

Defiance—Pres't, W. S. Powell, Defiance; Sec'y, Katherine Hoover, Defiance.

Delaware—Pres't, W. B. Hedges, Delaware; Sec'y, J. B. Woodworth, Delaware.

Erie—Pres't, Chas. Graefe, Sandusky; Sec'y, H. C. Schoepfle, Sandusky.

Fairfield—Pres't, J. H. Goss, Lancaster; Sec'y, G. O. Berry, Lancaster.

Fayette—Pres't, Geo. W. Blakeley, Washington C. H.; Sec'y, A. O. Ervin, Bloomingsburg.

Franklin—The Columbus Academy of Medicine—Pres't, Geo. M. Waters, Columbus; Sec'y, R. C. Tarbell, Columbus.

Fulton—Pres't, E. A. Murbach, Archbold; Sec'y, L. C. Cos-Grove, Swanton.

Gallia—Pres't, Ella G. Lupton, Gallipolis; Sec'y, C. G. Parker, Gallipolis.

Greene—Pres't, S. S. Wilson, Xenia; Sec'y, A. C. Messenger, Xenia.

Guernsey—Pres't, C. R. Austin, Byesville; Sec'y, F. W. Lane, Cambridge.

Hamilton—The Academy of Medicine of Cincinnati—Pres't, S. P. Kramer, Cincinnati; Sec'y, S. E. Cone, Cincinnati.

Hancock—Pres't, J. C. Tritch, Findlay; Sec'y, J. M. Firmin, Findlay.

Hardin—Pres't, R. L. Souder, Ada; Sec'y, Harry D. Belt, Kenton.

Harrison—Pres't, John D. West, Hopedale; Sec'y, J. A. McGrew, New Athens.

Henry—Pres't, E. B. Harrison, Napoleon; Sec'y, A. E. H. Maerker, Napoleon.

Highland—Pres't, H. A. Beeson, Leesburg; Sec'y, J. C. Larkin, Hillsboro.

Hocking—Pres't, A. K. Smith, Logan; Sec'y, O. S. Wood, Haydenville.

Jackson—Pres't, J. S. Hunter, Jackson; Sec'y, Worth Ray, Coalton.

Jefferson—Pres't, Enoch Pearce, Steubenville; Sec'y, J. R. Mosgrove, Steubenville.

Knox—Pres't, R. W. Colville, Mt. Vernon; Sec'y, H. W. Blair, Mt. Vernon.

Lake—Pres't, E. B. Root, Painesville; Sec'y, T. M. Moore, Willoughby.

Lawrence—Pres't, N. K. Moxley, Ironton; Sec'y, Alfred Robinson, Ironton.

Licking—Pres't, C. A. Foster, Newark; Sec'y, J. G. Shirer, Newark.

Logan—Pres't, L. C. Pratt, Bellefontaine; Sec'y, S. Morganroth, Bellefontaine.

Lorain—Pres't, O. T. Maynard, Elyria; Sec'y, Frank Young, Lorain.

Lucas—The Academy of Medicine of Toledo and Lucas County —Pres't, John A. Wright, Toledo; Sec'y, Chas. P. Wagar, 450 The Spitzer, Toledo.

Madison—Pres't, H. S. Quinn, West Jefferson; Sec'y, A. J. Strain, London.

Marion—Pres't, A. M. Crane, Marion; Sec'y, D. O. Weeks, Marion.

Medina—Pres't, P. E. Beach, Seville; Sec'y, C. D. Freeman, Medina.

Mercer—Pres't, C. F. Bolman, Coldwater; Sec'y, D. H. Richardson, Celina.

Miami—Pres't, R. D. Burnham, Piqua; Sec'y, J. R. Caywood, Piqua.

Montgomery—Pres't, J. C. Reeve, Dayton; Sec'y, Wilfred J. Taylor, 141 4th St., Dayton.

Morrow—Pres't, Geo. W. Moorehouse, Sparta; Sec'y, R. C. Spear, Mt. Gilead.

Muskingum—Pres't, C. W. Hanna, Zanesville; Sec'y, W. F. Sealover, Zanesville.

Ottawa—Pres't, Paul de la Barre, Port Clinton; Sec'y, S. F. Drumgold, Elmore.

Paulding—Pres't, L. R. Fast, Paulding; Sec'y, Ira J. Dix, Paulding.

Perry—Pres't, I. A. Moody, Junction City; Sec'y, J. G. McDougal, New Lexington.

Pike—Pres't, E. W. Tidd, Stockdale; Sec'y, O. C. Andre, Waverly.

Preble—Pres't, Frank McMichael, Eaton; Sec'y, P. M. Sater, Gratis.

Putnam—Pres't, John C. McClung, Leipsic; Sec'y, Wiley D. Hickey, Leipsic.

Richland—Pres't, M. T. Love, Shelby; Sec'y, J. Lillian McBride, Mansfield.

Sandusky—Pres't, R. H. Rice, Fremont; Sec'y, E. M. Ickes, Fremont.

Scioto—The Hempstead Academy of Medicine—Pres't, L. D. Allard, Portsmouth; Sec'y, J. S. Rardin, Portsmouth.

Seneca—Pres't, G. L. Hoege, Fostoria; Sec'y, R. B. Leister, Tiffin.

Shelby—Pres't, C. E. Johnson, Sidney; Sec'y, J. M. Sharpe, Sidney.

Stark—Pres't, Leon B. Santee, Marlboro; Sec'y, Frank Da Hinden, Canton.

Summit—Pres't, W. A. Searl, Cuyahoga Falls; Sec'y, E. W. Barton, Akron.

Trumbull—Pres't, T. M. Sabin, Warren; Sec'y, F. K. Smith, Warren.

Tuscarawas—Pres't, A. C. Dempster, Uhrichsville; Sec'y, Martha Shalter, Canal Dover.

Union—Pres't, A. B. Swisher, Marysville; Sec'y, S. J. Bown, Claiborne.

Vinton—Pres't, W. R. Moore, Swan; Sec'y, C. O. Dunlap, McArthur.

Warren—Pres't, E. Stevens, Lebanon; Sec'y, T. E. Keelor, Lebanon.

Washington—Pres't, Geo. T. Gale, Newport; Sec'y, T. G. Sellew, Stanleyville.

Williams—Pres't, John W. Riggs, Bryan; Sec'y, J. A. Weitz, Montpelier.

Wood—Pres't, H. L. Byington, Rising Sun; Sec'y, F. D. Halleck, Bowling Green.

Membership List

Abbott, C. N....1812 Freeman, Cincinnati..Acad. of Med. of Cincinnati.
Abbott, D. A....1624 Freeman, Cincinnati..Acad. of Med. of Cincinnati.
Abbott, J. D.....Bethel..Clermont County Med. Soc.
Abbott, N. W.....938 Clark, Cincinnati..Acad. of Med. of Cincinnati.
Ackerman, E. V.....Fredericktown..Knox County Med. Soc.
Adair, John W.....Marion..Marion County Med. Soc.
Adams, J. M....4210 Hamilton, Cincinnati..Acad. of Med. of Cincinnati.
Adams, Wm. T.....Maynard..Belmont County Med. Soc.
Aftel, Gustav.....1344 Nebraska, Toledo..Acad. of Med. of Toledo and Lucas County.
Agin, Chas. C.....1185 Dayton, Cincinnati..Acad. of Med. of Cincinnati.
Agnew, Wm.....Dayton..Montgomery Co. Med. Soc.
Albers, Henry W.....Cincinnati..Acad. of Med. of Cincinnati.
Albl, Michael A.....1464 B'way, Cleveland..Acad. of Med. of Cleveland.
Albright, G. H.....Lisbon..Columbiana Co. Med. Soc.
Alcorn, E. G.....Gallipolis..Gallia County Med. Soc.
Alcorn, J. G.....Gallipolis..Gallia County Med. Soc.
Alcorn, John B.....Gallipolis..Gallia County Med. Soc.
Alden, Eliot.....Lennox Bldg., Cleveland..Acad. of Med. of Cleveland.
Alderman, W. N.....Athens..Athens County Med. Soc.
Aldrich, Chas. J., 612 Prospect, Cleveland..Acad. of Med. of Cleveland.
Aldridge, J. D.....Sherodsville..Carroll County Med. Soc.
Alfred, C. M.....Lancaster..Fairfield County Med. Soc.
Allard, Lorenzo D., 1042 Linn, Portsmouth..Hempstead Acad. of Med.
Allen, A. B.....Glouster..Athens County Med. Soc.
Allen, Dudley P.....260 Euclid, Cleveland..Acad of Med. of Cleveland
Allen, G. M.....22 W. Seventh, Cincinnati..Acad. of Med. of Cincinnati.
Allen, J. P.,105 Lenox Bldg., Williamsburg..Clermont County Med. Soc.
Allen, S. E.....27 E. Twelfth, Cincinnati..Acad. of Med. of Cincinnati.
Allgaier, A. A.....3116 Auburn, Cincinnati..Acad. of Med. of Cincinnati.
Allison, W. R.....Hopedale..Harrison County Med. Soc.
Anders, C. I.....Oldfort..Seneca County Med. Soc.
Anderson, B. G.....9½ Main, Uhrichsville..Tuscarawas Co. Med. Soc.
Anderson, J. M.....Greenville..Darke County Med. Soc.
Anderson, James.....Salem..Columbiana Co. Med. Soc.
Anderson, L. C.....Greenville..Darke County Med. Soc.
Anderson, W. S.....Newtonsville..Clermont County Med. Soc.
Anderson, W. S.....Shelby..Richland County Med. Soc.
Anderson, Wm. V..903 Oakwood, Toledo..Acad. of Med. of Toledo and Lucas County.

Andre, Geo. B. M.....South Webster..Scioto County Med. Soc.
Andre, Orin C.....Waverly..Pike County Med. Soc.
Anzinger, F. P.....Springfield..Clark County Med. Soc.
Appleby, A. G.....Lorain..Lorain County Med. Soc.
Archer, J. C. C.....Neffs..Belmont County Med. Soc.
Arendt, D. A.....Portsmouth..Hempstead Acad. of Med.
Armstrong, E. E.....Sylvania..Wood County Med. Soc.
Arndt, G. D.....Mt. Vernon..Stark County Med Soc.
Arnold, E. E.....New Salem..Fairfield County Med. Soc.
Arnold, Geo. B.....Madisonville..Acad. of Med. of Cincinnati.
Arnold, Geo. D., 716 E. Prospect, Cleveland..Acad. of Med. of Cleveland.
Ashburn, A. W.....Batavia..Clermont County Med. Soc.
Ashfield, Chas. S., 120 Calhoun, Cincinnati..Acad. of Med. of Cincinnati.
Ashmun, Geo. C..794 Republic, Cleveland..Acad. of Med. of Cleveland.
Athey, R. W.....Marietta..Washington Co. Med. Soc.
Atkinson, F. P.....Millersport..Fairfield County Med. Soc.
Aufenwasser, Hugo, 119 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Austin, C. R.....Akron..Summit County Med. Soc.
Austin G. M.....Wilmington..Clinton County Med. Soc.
Axline, F. A.....Saltillo..Huntington Med. Soc.
Axline, John D.....Shawnee..Monroe County Med. Soc.
Axline, J. H.....Lancaster..Lancaster County Med. Soc.
Axtell, S. B.....Painesville..Lake County Med. Soc.
Ayres, S. E.....4 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Ayres, W. McLean...4 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.

Bacharach, F., 710 E. McMillan, Cincinnati..Acad. of Med. of Cincinnati.
Bachmayer, G. A.....Lima..Allen County Med. Soc.
Back, A. J.....Montpelier..Williams County Med. Soc.
Backrus, L. C.....Fayette..Fulton County Med. Soc.
Bailey, Gilberth....Ortiz Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Bailey, H. E.....Swanton..Fulton County Med. Soc.
Bailey, Robert..468 Willson ave., Cleveland..Acad. of Med. of Cleveland.
Bailey, V. M.....620 S. Wayne, Dayton..Montgomery Co. Med. Soc.
Bailey, W. W.....E. Liverpool..Columbiana Co. Med. Soc.
Bain, Frank D.....Kenton..Hardin County Med. Soc.
Baird, Jesse L.....901 Hicks, Toledo..Acad. of Med. of Toledo and Lucas County.
Baker, A. R., 604 New Eng. Bldg., Cleveland..Acad. of Med. of Cleveland.
Baker, Chas.....Greenville..Darke County Med. Soc.
Baker, Curtis L.....Kirkpatrick..Marion County Med. Soc.
Baker, J. Eugene.....Caledonia..Moore County Med. Soc.
Baker, J. H.....Piqua..Miami County Med. Soc.
Baker, Jos. P.....Findlay..Hancock County Med. Soc.

Baker, W. E.....Pleasantville..Fairfield County Med. Soc.
Baker, W. W.....Casstown..Miami County Med. Soc.
Baldwin, Francis M.....Marion..Marion County Med. Soc.
Baldwin, Henry, Jr.....Springfield..Clark County Med. Soc.
Baldwin, Hugh A.....Columbus..Columbus Acad. of Med.
Baldwin, J. F., Grant Hospital, Columbus..Columbus Acad. of Med.
Baldwin, W. S.....Lorain..Lorain County Med. Soc.
Ballard, C. B.....Marietta..Washington Co. Med. Soc.
Ballard, Homer C..1067 Pearl, Cleveland..Acad. of Med. of Cleveland.
Ballinger, J. B.....Greenville..Darke County Med. Soc.
Ballsman, Albert J.....Pleasant Hill..Miami County Med. Soc.
Ballsman, Samuel N.....Pleasant Hill..Miami County Med. Soc.
Balsley, Alfred W.....Findlay..Hancock County Med. Soc.
Banning, J. C.....Belle Center..Logan County Med. Soc.
Barckhoff, P. E.....Salem..Columbiana Co. Med. Soc
Barger, W. T.,486 Wade Park ave., Clev'l'nd..Acad. of Med. of Cleveland.
Barker, F. D.....29 N. Perry, Dayton..Montgomery Co. Med. Soc.
Barker, J. B.....Alcony..Miami County Med. Soc.
Barkhurst, S. O.....Steubenville..Jefferson County Med. Soc
Barlow, E. P.....Marietta..Washington Co. Med. Soc.
Barnes, Benj. F.....Newark..Licking County Med. Soc.
Barnes, E. J.....Granville..Monroe County Med. Soc.
Barnhill, James U....E. State, Columbus..Columbus Acad. of Med.
Baron, F. S.....Zanesville..Muskingum Co. Med. Soc.
Barr, W. E.....London..Madison County Med. Soc.
Barre, P. de le.....Port Clinton..Ottawa County Med. Soc.
Barrere, D. M....117 S. Huffman, Dayton..Montgomery Co. Med. Soc.
Barrett, E. M.....Cleveland..Acad. of Med. of Cleveland.
Barrett, Van F.....Lakeview..Logan County Med. Soc.
Barringer, David.....Rocky Ridge..Ottawa County Med. Soc.
Barstow, C. M.....Bryan..Williams County Med. Soc.
Bartley, M. A., 795 W. Broad, Columbus..Columbus Acad. of Med.
Barton, E. W.....Akron..Summit County Med. Soc.
Barton, Robert S.....New Philadelphia..Tuscarawas Co. Med. Soc.
Batchelor, E. J...12 Calhoun, Cincinnati..Acad. of Med. of Cincinnati.
Bates, F. L.....Lima..Allen County Med. Soc.
Bauer, Arthur C...1634 Johns, Cincinnati..Acad. of Med. of Cincinnati.
Bauer, M. M.....Lake..Stark County Med. Soc.
Bayham, A. J.....Elm Grove..Pike County Med. Soc.
Beach, P. E.....Seville..Medina County Med. Soc.
Beall, J. T.....Coshocton..Coshocton Co. Med. Soc.
Beam, A. H.....Hillsboro..Highland County Med. Soc.
Beam, H. H.....E. Liverpool..Columbiana Co. Med. Soc.
Beardsley, C. E., Life member.....Ottawa..Putnam County Med. Soc.

Beardsley, H. J.....Findlay..Hancock County Med. Soc.
Beck, John S.....34 W. 5th, Dayton..Montgomery Co. Med. Soc.
Becker, Henry A....1200 Pearl, Cleveland..Acad. of Med. of Cleveland.
Beckwith, A. S.....Plumwood..Madison County Med. Soc.
Beckwith, Seth W.....708 Main, Toledo..Acad. of Med. of Toledo and Lucas County.
Beebe, Brooks F...708 B'way, Cincinnati..Acad. of Med. of Cincinnati.
Beery, G. O.....Lancaster..Fairfield County Med. Soc.
Beery, J. C.....Alledonia..Belmont County Med. Soc.
Beery, James S.....Peebles..Adams County Med. Soc.
Beeson, H. A.....Leesburg..Highland County Med. Soc.
Begg, W. H.....Columbus Grove..Putnam County Med. Soc.
Belkowski, I. W., 330 Woodland, Cleveland..Acad. of Med. of Cleveland.
Bell, Albert J.....Ridgeway, Cincinnati..Acad. of Med. of Cincinnati.
Bell, Read L.....60 Spring, Springfield..Clark County Med. Soc.
Bell, Wm. H., 3764 Clifton ave., Cincinnati..Acad. of Med. of Cincinnati.
Belt, Chas.....Batavia..Clermont County Med. Soc.
Belt, John H., 1434 Willson ave., Cleveland..Acad. of Med. of Cleveland.
Belt, Richard C.....Milford..Clermont County Med. Soc.
Benedict, Chas. W.....Findlay..Hancock County Med. Soc.
Benkert, L. C....165 E. Russell, Columbus..Columbus Acad. of Med.
Benner, C. T.....Tiffin..Seneca County Med. Soc.
Benner, W. H.....Tiffin..Seneca County Med. Soc.
Bennett, C. A.....Withamsville..Clermont County Med. Soc.
Bennett, Chas. E.....Wauseon..Fulton County Med. Soc.
Bennett, W. C.....Mt. Gilead..Morrow County Med. Soc.
Berker, B.....Valentine, Toledo..Acad. of Med. of Toledo and Lucas County.
Berlin, Wm. K. C., 483 Prospect, Cleveland..Acad. of Med. of Cleveland.
Bernheim, Ruth, 2241 Kemperlane, Cincinnati..Acad. of Med. of Cincinnati
Bernstein, S. L, Colorado Springs, Col...Allen Vista Hotel.
Bessey, J. M.....1814 Adams, Toledo..Acad. of Med. of Toledo and Lucas County.
Betham, A. C.....Bellaire..Belmont County Med. Soc.
Bett, H. D.....Kenton...Hardin County Med. Soc.
Bettman, Henry W..43 Groton, Cincinnati..Acad. of Med. of Cincinnati.
Betts, Chas.....1403 Jefferson, Toledo..Acad. of Med. of Toledo and Lucas County.
Betz, I. S.....180 Hough ave., Cleveland..Acad. of Med. of Cleveland.
Bevington, E. E.....Sulphur Spring...Crawford County Med. Soc.
Beyer, G. K.....Lorain..Lorain County Med. Soc.
Bice, A. W.....Lima...Allen County Med. Soc.
Biddle, D. H.....Athens..Athens County Med. Soc.
Biggar, H. F., Jr., 260 Euclid ave., Cleveland..Acad. of Med. of Cleveland.

Binkley, A.....Dayton..Montgomery Co. Med. Soc.
Birchard, A. D., 1201 Harrison, Cincinnati..Acad. of Med. of Cincinnati.
Bird, Chas. W.....Continental..Putnam County Med. Soc.
Birge, R. E., 260 Euclid ave., Cleveland..Acad. of Med. of Cleveland.
Birk, J. W.....Bucyrus..Crawford County Med. Soc.
Bishop, P. S.....Delta..Fulton County Med. Soc.
Bishop, S. P.....Delta..Fulton County Med. Soc.
Black, A. P.....Bradner..Wood County Med. Soc.
Black, J. F....800 Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Black, R. R.....Galion..Crawford County Med. Soc.
Blackburn, A. D.....Cuba..Clinton County Med. Soc.
Blackburn, A. M.....Steubenville..Jefferson County Med. Soc
Blackburn, M. E., 768 N. High, Columbus..Columbus Acad. of Med.
Blackford, J. M.....Martins Ferry..Belmont County Med. Soc.
Blair, Benj. H.....Lebanon..Warren County Med. Soc.
Blair, H. W.....Mt. Vernon..Knox County Med. Soc.
Blair, Thos.....Lyons..Fulton County Med. Soc.
Blake, Francis W., 1853 E. State, Columbus..Columbus Acad. of Med.
Bland, Jerome.....Bucyrus..Crawford County Med. Soc.
Blazer, H. E.....Salineville..Columbiana Co. Med. Soc.
Bliss, H. C.....413 Woodland, Cleveland..Acad. of Med. of Cleveland.
Bliss, Theo. F., 85 E. High, Springfield..Clark County Med. Soc.
Bloome, D. M.....New Waterford..Columbiana Co. Med. Soc.
Bloomfield, Jno. .....Napoleon..Henry County Med. Soc.
Blue, N. S.....Ayersville..Defiance County Med. Soc.
Boal, A. A.....Zaleski..Vinton County Med. Soc.
Bobbs, A. C.....Paulding..Paulding County Med. Soc.
Boerdish, R. C.....Marion..Marion County Med. Soc.
Boerstler, G. W., Life member...Lancaster..Fairfield County Med. Soc.
Boggs, Jesse.....1207 Euclid, Cleveland..Acad. of Med. of Cleveland.
Bohl, J. P.....Watertown..Washington Co. Med. Soc.
Bohl, Jacob.....Marietta..Washington Co. Med. Soc.
Bohlender, E. E.....1913 3rd, Dayton..Montgomery Co. Med. Soc.
Bolman, C. F.....Coldwater..Mercer County Med. Soc.
Bonifield, C. L....422 W. 4th, Cincinnati..Acad. of Med. of Cincinnati.
Bonner, Horace.....141 W. 4th, Dayton..Montgomery Co. Med. Soc.
Bonner, O. W.....Delaware..Delaware County Med. Soc.
Bonnette, A. O., 220 E. State, Columbus..Columbus Acad. of Med.
Book, R. D.....Corning..Perry County Med. Soc.
Bookwalter, D. R....1015 W. 3rd, Dayton..Montgomery Co. Med. Soc.
Bookwalter, H.....Columbiana..Columbiana Co. Med. Soc.
Boone, A.....Englewood..Montgomery Co. Med. Soc.
Boone, D. W.....Bellaire..Belmont County Med. Soc.
Booth, W. J.....Salem..Columbiana Co. Med. Soc.

Borts, Mathias..975 Woodland, Cleveland..Acad. of Med. of Cleveland.
Bowen, H. W.....New Washington..Crawford County Med. Soc
Bower, Chas. F., 226 E. State, Columbus..Columbus Acad. of Med.
Bowers, I. S.....Perrysburg..Wood County Med. Soc.
Bowman, D. E.....1619 Western, Toledo..Acad. of Med. of Toledo and Lucas County.
Bowman, D. S.....Akron..Summit County Med. Soc.
Bowman, G. I..Lakeside Hosp., Cleveland..Acad. of Med. of Cleveland
Bown, S. J.....Claiborne..Union County Med. Soc.
Boyd, J. P.....Akron..Summit County Med. Soc.
Bradfield, C. R.....Danville..Knox County Med. Soc.
Bradford, Wm. N.....Cambridge..Guernsey County Med. Soc.
Bradley, I. A....State Hospital, Columbus..Columbus Acad. of Med.
Brady, A. P.....Painesville..Lake County Med. Soc.
Brady, M. B., 3726 Terrace pl., Cincinnati..Acad. of Med. of Cincinnati.
Brainard, H. C..1712 Superior, Cleveland..Acad of Med. of Cleveland.
Bramble, D. D..511 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Brannan, Thos. H.....Canal Dover..Tuscarawas Co. Med. Soc.
Brattain, G. W.....Antwerp..Paulding County Med. Soc.
Breck, Theo.....Lorain..Lorain County Med. Soc.
Breidenbach, C. H.....Dayton..Montgomery Co. Med. Soc.
Briggs, C. E....Euclid & Perry, Cleveland..Acad. of Med. of Cleveland.
Briggs, E.....Wilmington..Clinton County Med. Soc.
Bright, Wm. E.....N. Hampton..Clark County Med. Soc.
Britton, E. E.....McClure..Henry County Med. Soc.
Britton, Samuel H.....Marion..Marion County Med. Soc.
Brockett, A. J..32 Hawthorne, Cleveland..Acad. of Med. of Cleveland.
Brokaw, Wm.F.,1040 Willson ave.,Cleveland..Acad. of Med. of Cleveland.
Brown, B. F.....New Philadelphia..Tuscarawas Co. Med. Soc.
Brown, C. C.....Mansfield..Richland County Med. Soc.
Brown, E. D..1617 Cedar ave., Cleveland..Acad. of Med. of Cleveland.
Brown, E. E....Citizens' Bldg., Cleveland..Acad. of Med. of Cleveland.
Brown, E. M.....Amelia..Clermont County Med. Soc.
Brown, E. O.....Lorain..Lorain County Med. Soc.
Brown, G. T.....Center..Montgomery Co. Med. Soc.
Brown, G. W.....Hebron..Licking County Med. Soc.
Brown, H. A.....Carroll..Fairfield County Med. Soc.
Brown, J. A.....Germantown..Montgomery Co. Med. Soc.
Brown, J. E., 239 E. Town, Columbus..Columbus Acad. of Med.
Brown, J. E.....13 Race, Cincinnati..Acad. of Med. of Cincinnati.
Brown, Mark, Flat 4, 628 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Brown, T. L.....Galion..Crawford County Med. Soc.
Brown, Wm. G.....Lewisburg..Preble County Med. Soc.
Brubaker, Geo. F.....65 High, Springfield..Clark County Med. Soc.

Brubaker, J. L.....West Hope..Henry County Med. Soc.
Brubaker, M. M.....Covington..Miami County Med. Soc.
Brubaker, P. B.....Bucyrus..Crawford County Med. Soc.
Bruce, C. A..606 Neave Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Brumm, Louis D.....Celina..Mercer County Med. Soc.
Brundage, L. H.....Xenia..Greene County Med. Soc.
Brundage, N. E.....Delphos..Allen County Med. Soc.
Bruner, W. E.,514 New England, Clevel'nd..Acad. of Med. of Cleveland.
Brunning, F....411 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Brush, E. C.....Zanesville..Muskingum Co. Med. Soc.
Buchanan, H. A..1041 Purcell, Cincinnati..Acad. of Med. of Cincinnati.
Buck, A. H.....Delaware..Delaware County Med. Soc.
Buck, B. B.....Harlem Springs..Carroll County Med. Soc.
Bucker, C. H.....Spring Mountain..Coshocton Co. Med. Soc.
Buckingham, J. M., Buckingham Blk.,
Springfield..Clark County Med. Soc.
Buckner, J. H., Life member,
333 E. 4th, Cincinnati..Acad. of Med. of Cincinnati.
Buell, J. J.....602 Pearl, Cleveland..Acad. of Med. of Cleveland.
Buhlig, W. H.....Gallipolis..Gallia County Med. Soc.
Bunce, W. C.....Oberlin..Lorain County Med. Soc.
Bunn, J. W., Life member... .West Union..Adams County Med. Soc.
Bunn, R. A.....233 N. Valley, Dayton..Montgomery Co. Med. Soc.
Bunts, F. E..204 Osborn Bldg., Cleveland..Acad. of Med. of Cleveland.
Burdick, H. J., 579 Cedar ave., Cleveland..Acad. of Med. of Cleveland.
Burgoyn, J. A..137 E. State, Columbus..Columbus Acad. of Med.
Burke, T. A.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Burley, S. V.....Lorain..Lorain County Med. Soc.
Burner, G. W.....Hardin..Shelby County Med. Soc.
Burnes, Jno. M.....Mansfield..Richland County Med. Soc.
Burnham, R. D.....Piqua..Miami County Med. Soc.
Burns, Wm. A.....236 W. 6th, Dayton..Montgomery Co. Med. Soc.
Burson, A. L.....Irwin..Union County Med. Soc.
Burton, E. G.....Lima..Allen County Med. Soc.
Busch, Wm.....Sandusky..Erie County Med. Soc.
Buschmann, H.....1409 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Butler, Owen W.....Hartwell..Hamilton County Med. Soc.
Buttemiller, Geo. S....628 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Buttemiller, J. C..2530 Auburn, Cincinnati..Acad. of Med. of Cincinnati.
Button, W. H.....Hubbard..Trumbull County Med. Soc.
Byers, P. W.....Greenville..Darke County Med. Soc.
Byington, H. L.....Rising Sun..Wood County Med. Soc.
Byrne, P. J....Pearl & Detroit, Cleveland..Acad. of Med. of Cleveland.

Cable, Thos. B.....Pemberton..Shelby County Med. Soc.
Cadwallader, J. C.....Norwood..Acad. of Med. of Cincinnati.
Cain, A. R.....Akron..Summit County Med. Soc.
Caldwell.....410 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Caldwell, C. E....Croton Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Caldwell, Frank..48 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Caldwell, J. A., Jr., College Hill, Cincinnati..Acad. of Med. of Cincinnati.
Caldwell, J. L.....Waverly..Pike County Med. Soc.
Calhoun, G. E.....Maynard..Columbiana Co. Med. Soc.
Calhoun, Wm. W.....E. Liverpool..Belmont County Med. Soc.
Calkins, Thos. J...2050 Superior, Cleveland..Acad of Med. of Cleveland.
Calving, H. M.....Salineville..Columbiana Co. Med. Soc.
Cameron, E. .....Lorain..Lorain County Med. Soc.
Cameron, O. L.....11 E. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Cameron, R. B.....Jewell..Defiance County Med. Soc.
Campbell, A. D..2209 Superior, Cleveland..Acad of Med. of Cleveland.
Campbell, C. S.....Wauseon..Fulton County Med. Soc.
Campbell, E..2 Somerset Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Campbell, F. D.....Rockcamp..Lawrence County Med. Soc.
Campbell, H. G.....Logan..Hocking County Med. Soc.
Campbell, J. S.....West Park..Acad. of Med. of Cleveland.
Campbell, O. B...993 Cedar ave., Cleveland..Acad. of Med. of Cleveland.
Campbell, Wm. H., 330 E. 4th, Cincinnati..Acad. of Med. of Cincinnati
Cannedy, M. H.....Painesville..Lake County Med. Soc.
Cannon, J. L.....Mt. Sterling..Madison County Med. Soc.
Carboy, C. C.....Winchester..Adams County Med. Soc.
Carey, M. J.....791 Doan, Cleveland..Acad. of Med. of Cleveland.
Carleton, E. E..Mt. Vernon ave., Columbus..Columbus Acad. of Med.
Carleton, J. S.....4th & Neil, Columbus..Columbus Acad. of Med.
Carlisle, I. C.....Glenville..Acad. of Med. of Cleveland.
Carmichael, W. A.....Loveland..Clermont County Med. Soc.
Carney, A. C.....Eldorado..Preble County Med. Soc.
Carothers, Robt..413 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Carpenter, J. W., 908 E. McMillan,
Cincinnati..Acad. of Med. of Cincinnati
Carr, E. C.....Coshocton..Coshocton Co. Med. Soc.
Carr, J. G.....Coshocton..Coshocton Co. Med. Soc.
Carroll, F. S....2564 Superior, Cleveland..Acad. of Med. of Cleveland.
Carroll, R. S.....Marysville..Union County Med. Soc.
Carroll. T.....114 E. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Carson, A. I..46 E. McMillan, Cincinnati..Acad. of Med. of Cincinnati.
Carter, C. C.....300 E. Long, Columbus..Columbus Acad. of Med.
Carter, E. L.....Carrollton..Carroll County Med. Soc.
Carter, E. P.....260 Euclid, Cleveland..Acad. of Med. of Cleveland.

Carter, H. H.....W. Alexandria..Preble County Med. Soc.
Carter, Jno. M.....Jackson Center..Shelby County Med. Soc.
Cartwright, J. W.....Payne..Paulding County Med. Soc.
Caruso, G.....9½ Woodland, Cleveland..Acad. of Med. of Cleveland.
Case, W. L.....Mt. Gilead..Morrow County Med. Soc.
Casello, J. B.....427 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Caves, D. T.....Lykens..Crawford County Med. Soc.
Caywood, J. R.....Piqua..Miami County Med. Soc.
Chabot, Geo. W.....Otway..Scioto County Med. Soc.
Chadwick, L. S..1824 Euclid ave., Cleveland..Acad. of Med. of Cleveland.
Chamberlain, R. C.....Tiffin..Seneca County Med. Soc.
Chamberlain, W. B., Osborn Bldg., Cl'v'l'nd..Acad. of Med. of Cleveland.
Chamberlen, C. S..5th & Pike, Cincinnati..Acad. of Med. of Cincinnati.
Champlin, H. D.....662 Clark, Cleveland..Acad. of Med. of Cleveland.
Chaney, G.....New Guilford..Coshocton Co. Med. Soc.
Chapman, G. L....1704 Madison, Toledo..Montgomery Co. Med. Soc.
Chapman, Wm. C...1704 Madison, Toledo..Montgomery Co. Med. Soc.
Chase, W. S.....Akron..Summit County Med. Soc.
Cheatham, E. C.....Marion..Marion County Med. Soc.
Cheney, W. G.....Portsmouth..Hempstead Acad. of Med.
Cherrington, J. S.....Pinegrove..Gallia County Med. Soc.
Cherry, W. T.....McArthur..Vinton County Med. Soc.
Chidester, C. W.....Delaware..Delaware County Med. Soc.
Childs, L. W.....345 Melvin, Cleveland..Acad. of Med. of Cleveland.
Chisholm, H.....Marion..Marion County Med. Soc.
Chollette, B. G.....626 Front, Toledo..Montgomery Co. Med. Soc.
Christian, Theo.....22 W. 4th, Cincinnati..Acad. of Med. of Cincinnati.
Christian, W. I.....Verona..Preble County Med. Soc.
Christopher, W. H.....Sterling..Madison County Med. Soc.
Clapp, H. T..N. England Bldg., Cleveland..Acad. of Med. of Cleveland.
Clark, A. T.....Vinton..Gallia County Med. Soc.
Clark, C. S.....Leesville..Carroll County Med. Soc.
Clark, Chas. F....188 E. State, Columbus..Columbus Acad. of Med.
Clark, E. A.....Paulding..Paulding County Med. Soc.
Clark, F. S.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Clark, H. F.....Rarden..Scioto County Med. Soc.
Clark, J. A.....Bellaire..Belmont County Med. Soc.
Clark, J. H., Life member..Mechanicsburg..Champaign Co. Med. Soc.
Clark, T. W...Lakeside Hosp., Cleveland..Acad. of Med. of Cleveland.
Clark, Wm. R.....E. Liverpool..Columbiana Co. Med. Soc.
Clark, Wm. S..778 Central ave., Cleveland..Acad. of Med. of Cleveland.
Clayton, B. F.....Franklin..Warren County Med. Soc.
Clegett, P. D.....Ridgeville..Warren County Med. Soc.
Clemmer, J. U.....112 Parson, Columbus..Columbus Acad. of Med.

Clemons, J.....Newhope..Brown County Med. Soc.
Clemson, G. W.....Thornville..Perry County Med. Soc.
Cleveland, J. L.....838 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Cline, H. W.....Sitka..Washington Co. Med. Soc.
Clouse, Lewis.....Somerset..Perry County Med. Soc.
Clouse, Michael .....Somerset..Perry County Med. Soc.
Coates, Benj. O....1732 Euclid, Cleveland..Acad. of Med. of Cleveland
Cobb, P. W..U. R. W. Med. Dept.,
Cleveland..Acad. of Med. of Cleveland
Coen, B. F.....Gnadenhutten..Tuscarawas Co. Med. Soc.
Cogan, J. E.....1117 Superior, Cleveland..Acad. of Med. of Cleveland
Cohen, A.....864 Woodland, Cleveland..Acad. of Med. of Cleveland
Coldham, Wm. W..336 Michigan, Toledo..Acad. of Med. of Toledo and Lucas County.
Cole, A. P.....Cincinnati..Acad. of Med. of Cincinnati.
Cole, C. B.....1511 Detroit, Toledo..Acad. of Med. of Toledo and Lucas County.
Cole, C. C.....Bridgeport..Belmont County Med. Soc.
Cole, W. U.....185 E. State, Columbus..Columbus Acad. of Med.
Coleman, N. R...264 E. Town, Columbus..Columbus Acad. of Med.
Coleman, W.....Troy..Miami County Med. Soc.
Coleman, W. K..... .West Union..Adams County Med. Soc.
Coleville, R. W.....Mt. Vernon..Knox County Med. Soc.
Collins, E. F.....London..Madison County Med. Soc.
Collins, H. O.....Dayton..Montgomery Co. Med. Soc.
Collins, T. W.....Toronto..Jefferson County Med. Soc.
Colter, LeRoy S..3410 Clifton, Cincinnati..Acad. of Med. of Cincinnati
Colver, C. B.....260 Euclid, Cleveland..Acad. of Med. of Cleveland
Combs, J. W.....Camden..Preble County Med. Soc.
Combs, R. V....1185 Franklin, Columbus..Columbus Acad. of Med.
Conarroe, A. W. Y.....West Elkton..Columbiana Co. Med. Soc.
Cone, S. E.....719½ Central, Cincinnati..Acad. of Med. of Cincinnati
Conger, M.....14 W. 7th, Cincinnati..Acad. of Med. of Cincinnati
Conklin, D. B.....17 E. 1st, Dayton..Montgomery Co. Med. Soc.
Conklin, Wm. J., Life member, 17 E. 1st,
Dayton..Montgomery Co. Med. Soc.
Conley, C. W.....Eaton..Preble County Med. Soc.
Conner, P. S., Life member, 215 W. 9th,
Cincinnati..Acad. of Med. of Cincinnati
Conrad, Geo. R.....New Vienna..Clinton County Med. Soc.
Conrad, Wm....734 Rose Bldg., Cleveland..Acad. of Med. of Cleveland
Conwell, C. B.....Cincinnati..Acad. of Med. of Cincinnati
Cook, A. F.....Sandusky..Erie County Med. Soc.
Cook, A. J....1395 Euclid ave., Cleveland..Acad. of Med. of Cleveland.
Cook, E.....Hamilton..Butler County Med. Soc.

Cook, G. T.....Oxford..Butler County Med. Soc.
Cook, H. R.....Oxford..Butler County Med. Soc.
Cook, J. E..514 New England, Cleveland..Acad. of Med. of Cleveland.
Cook, L. E.....3519 Warsaw, Cincinnati..Acad. of Med. of Cincinnati
Cooksey, T. L.....Wilmington..Clinton County Med. Soc.
Cooper, Albert..44 E. Duncan, Columbus..Columbus Acad. of Med.
Cooper, J. W.,.....Bellaire..Belmont County Med. Soc.
Cope, A. L.....Winona..Columbiana Co. Med. Soc.
Cope, E. C.....Barton..Belmont County Med. Soc.
Cordier, H. J.....Rockford..Mercer County Med. Soc.
Corey, M. D.....Marion..Marion County Med. Soc.
Corlett, Wm. T..553 Euclid ave., Cleveland..Acad. of Med. of Cleveland.
Cornetet, E. W.....Piketon..Pike County Med. Soc.
Corson, O. M.....Middletown..Butler County Med. Soc.
Corwin, M. M.....Greenville..Darke County Med. Soc.
CosGrove, L. C.....Swanton..Fulton County Med. Soc.
CosGrove, S. F.....Swanton..Fulton County Med. Soc.
Costello, T. A.....397 Willson, Cleveland..Acad. of Med. of Cleveland.
Coster, H. A.....Hampton..Clark County Med. Soc.
Costolo, J. W.....Sidney..Shelby County Med. Soc.
Cotton, J. D., Life member.....Marietta..Washington Co. Med. Soc.
Couden, J. M.....Morrow..Warren County Med. Soc.
Courtright, G. S., Life member..Lithopolis..Fairfield County Med. Soc.
Courtright, T. E..193 E. State, Columbus..Columbus Acad. of Med.
Covington, P. D.....Bellefontaine..Logan County Med. Soc.
Cowles, G. E.....Ostrander..Delaware County Med. Soc.
Cowley, R. H.....Lorain..Lorain County Med. Soc.
Cox, O. S.....Allensville..Vinton County Med. Soc.
Cox, S. S.....Lorain..Lorain County Med. Soc.
Coy, M. E.....736 Xenia, Dayton..Montgomery Co. Med. Soc.
Cozard, H. I.....Akron..Summit County Med. Soc.
Cragg, H. C.....9 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati
Craig, T. E.....Sabina..Clinton County Med. Soc.
Crane, A. M.....Marion..Marion County Med. Soc.
Crane, H. C.....Kilbourne..Delaware County Med. Soc.
Crane, Wm. H.....20 W. 7th, Cincinnati..Acad. of Med. of Cincinnati
Crawford, A. J.....Glouster..Athens County Med. Soc.
Crawford, G. M.....Lorain..Lorain County Med. Soc.
Crawford, L. A.....Hopedale..Harrison County Med. Soc.
Crawford, O. C.....Stone Creek..Tuscarawas Co. Med. Soc.
Crawford, T. C.....Dunkinsville..Adams County Med. Soc.
Creps, A. H.....Lima..Allen County Med. Soc.
Crew, E.....Dayton..Montgomery Co. Med. Soc.
Crickard, W. F.....Delaware..Delaware County Med. Soc.

Crile, G. W..204 Osborn Bldg., Cleveland..Acad. of Med. of Cleveland.
Crisswell, D. M.....Plainfield..Coshocton Co. Med. Soc.
Croft, J. W.....Corning..Perry County Med. Soc.
Cropper, C. C.....Newmarket..Highland County Med. Soc.
Cross, F. B.....32 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Crossen, K. T.....Carbondale..Athens County Med. Soc.
Crowell, W. S....Franklin ave., Cleveland..Acad. of Med. of Cleveland.
Crum, E. G.....413 E. 3rd, Dayton..Montgomery Co. Med. Soc.
Culbertson, J. C....317 W. 7th, Cincinnati..Acad. of Med. of Cincinnati
Culbertson, L. R.....Zanesville..Muskingum Co. Med. Soc.
Cullen, C. W...8th & Freedom, Cincinnati..Acad. of Med. of Cincinnati.
Cummings, J. V.....Farmersville..Montgomery Co. Med. Soc.
Cunningham, S. A.....Marietta..Washington Co. Med. Soc.
Curry, F. C.....Milford..Clermont County Med. Soc.
Cushing, C. H.....Elyria..Lorain County Med. Soc.
Cushing, E. F.....1160 Euclid, Cleveland..Acad. of Med. of Cleveland.
Cushing, G. F.....Elyria..Lorain County Med. Soc.
Cushing, H. K., Life member....Cleveland..Acad. of Med. of Cleveland.
Custer, Geo. .....Scio..Harrison County Med. Soc.
Custer, H. J.....62 E. Broad, Columbus..Columbus Acad. of Med.

Dabney, W. R.....Marietta..Washington Co. Med. Soc.
Dager, W. F.....Lorain..Lorain County Med. Soc.
Dale, Geo. R.....1224 W. 3rd, Dayton..Montgomery Co. Med. Soc.
Dandridge, N. P., Life member,
422 Broadway, Cincinnati..Acad. of Med. of Cincinnati
Danford, E. F.....Glouster..Athens County Med. Soc.
Danford, G. V.....Trimble..Athens County Med. Soc.
Danford, H. D.....Trimble..Athens County Med. Soc.
Danziger, Leo.....34 W. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Darby, F. H.....28 W. 1st ave., Columbus..Columbus Acad. of Med.
Darby, J. C.....2238 Euclid, Cleveland..Acad. of Med. of Cleveland.
Davenport, A. B.....Miller, Columbus..Columbus Acad. of Med.
Davidson, H. S.....Barberton..Summit County Med. Soc.
Davidson, N. P.....Hilliard..Columbus Acad. of Med.
Davis, C. W.....902 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Davis, Carrie C.....Sandusky..Erie County Med. Soc.
Davis, D. J....Race & Liberty, Cincinnati..Acad. of Med. of Cincinnati
Davis, E. B.....Covington..Miami County Med. Soc.
Davis, E. B.....Troy..Miami County Med. Soc.
Davis, E. F.....20 W. High, Springfield..Clark County Med. Soc.
Davis, F. W.....258 Franklin, Cleveland..Acad. of Med. of Cleveland.
Davis, F. W....498 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Davis, G. W.....Lockland..Hamilton County Med. Soc.

Davis, George.....New Jasper..Greene County Med. Soc.
Davis, J. D....3rd & Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Davis, J. I.....Shawnee..Perry County Med. Soc.
Davis, J. W.....Defiance..Defiance County Med. Soc..
Davis, M. J.....Mansfield..Richland County Med. Soc.
Davis, N. R.....200 E. State, Columbus..Columbus Acad. of Med.
Davison, Monroe.....West Newton..Allen County Med. Soc.
Davisson, E. C.....217 S. Ludlow, Dayton..Montgomery Co. Med. Soc.
Davisson, J. A...715 Washington, Dayton..Montgomery Co. Med. Soc.
Davy, J. O.....Springfield..Clark County Med. Soc.
Day, H. M.....Delaware..Delaware County Med. Soc
Death, H. J.....Franklin..Warren County Med. Soc.
Deaton, Van S.....Alcony..Miami County Med. Soc.
DeCourcey, W. E..827 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Deemer, W. R.....Fremont..Sandusky County Med. Soc
Deemy, J. S.....Bellefontaine..Logan County Med. Soc.
Deheen, D. D.....Oxford..Butler County Med. Soc.
Delscamp, Wm. H..114 W. 3rd st., Dayton..Montgomery Co. Med. Soc.
Dempster, A. C.....Uhrichsville..Tuscarawas Co. Med. Soc.
Denman, H. B.....Lena..Miami County Med. Soc.
Denman, L. M.....135 W. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Dennis, C. D.....53 E. Rich, Columbus..Columbus Acad. of Med.
Deuschle, W.D., 119 Lexington, Columbus..Columbus Acad. of Med.
Devers, A. B..3334 Reading rd., Cincinnati..Acad. of Med. of Cincinnati
DeVilbiss, A.....1220 Jackson, Toledo..Acad. of Med. of Toledo and Lucas County.
Dewitt, W. H., 61 Auburndale pl., Cincinnati..Acad. of Med. of Cincinnati.
Dial, E. L.....1847 Lorain, Cleveland..Acad. of Med. of Cleveland.
Dice, S. D.....Xenia..Greene County Med. Soc.
Dice, Wm. G.....242 Michigan, Toledo..Acad. of Med. of Toledo and Lucas County.
Dick, W. L.....77 E. State, Columbus..Columbus Acad. of Med.
Dickenson, Jno.....32 Sibley, Cleveland..Acad. of Med. of Cleveland.
Dickenson, T....2457 Eastern, Cincinnati..Acad. of Med. of Cincinnati.
Dickes, P.....Greenville..Darke County Med. Soc.
Dickey, E. J..Children's Hosp., Cincinnati..Acad. of Med. of Cincinnati
Dickey, T. A.....Middletown..Butler County Med. Soc.
Diekmeier, H. P.....10 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Dillinger, T. J.....Logan..Hocking County Med. Soc.
Dillon, J.....New Castle..Coshocton Co. Med. Soc.
Dittrick, H....Lakeside Hosp., Cleveland..Acad. of Med. of Cleveland.
Diven, A. W.....Martins Ferry..Belmont County Med. Soc.
Dix, I. J.....Paulding..Paulding County Med. Soc.
Dixon, E. M.....Stockdale..Pike County Med. Soc.

Dixon, G. M.....10 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Dixon, M. T.....576 S. 3rd, Columbus..Columbus Acad. of Med.
Doherty, E. W.....2946 Detroit, Toledo..Montgomery Co. Med. Soc.
Dolina, J. F.....134 W. 4th, Dayton..Montgomery Co. Med. Soc.
Dolley, D. H....Charity Hosp., Cleveland..Acad of Med. of Cleveland.
Dolloway, L. M..1604 Collingwood, Toledo..Montgomery Co. Med. Soc.
Dombaugh, R. S.....Waldo..Marion County Med. Soc.
Domhoff.....108 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Donaldson, O. V.....Gore..Hocking County Med. Soc.
Donley, Jno.....Columbus..Columbus Acad. of Med.
Donnell, C.....936 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Douglass, C. F.....Kalida..Putnam County Med. Soc.
Douthitt, J. E.....Canal Dover..Tuscarawas Co. Med. Soc.
Dowling, F.....128 W. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Downing, M. L.....Rockford..Mercer County Med. Soc.
Drayer, S. P.....W. Alexandria..Preble County Med. Soc.
Drennan, J. N.....Loydsville..Belmont County Med. Soc.
Driver, O. P.....Bremen..Fairfield County Med. Soc.
Dromgold, S. L.....Elmore..Ottawa County Med. Soc.
Drury, Alex. G....625 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Duckwall, F. A.....115 N. Valley, Dayton..Montgomery Co. Med. Soc.
Dugan, J. P.....70 E. High, Springfield..Clark County Med. Soc.
Duncan, A. M.....Bucyrus..Crawford County Med. Soc.
Duncan, J. A.....1107 Broadway, Toledo..Acad. of Med. of Toledo and Lucas County.
Dunham, A. H....108 N. Ludlow, Dayton..Montgomery Co. Med. Soc.
Dunham, J. D....187 E. State, Columbus..Columbus Acad. of Med.
Dunham, M. J....222 E. Town, Columbus..Columbus Acad. of Med.
Dunham, R. H.....McMillan, Cincinnati..Acad. of Med. of Cincinnati.
Dunham, W. H.....Auburn, Cincinnati..Acad. of Med. of Cincinnati.
Dunlap, C. O.....McArthur..Vinton County Med. Soc.
Dunlap, R. S.....Greenfield..Highland County Med. Soc.
Dunn, E. S.....Port Washington..Tuscarawas Co. Med. Soc.
Dunn, J. J.....984 Superior, Cleveland..Acad. of Med. of Cleveland.
Dunn, O. B.....Ironton..Lawrence Couny Med. Soc.
Dupler, Wm. B.....Crooksville..Perry County Med. Soc.
Dupuy, T. V.....120 S. Ludlow, Dayton..Montgomery Co. Med. Soc.
Dutton, C. F.....626 Franklin, Cleveland..Acad. of Med. of Cleveland.
Dye E. A.....Vienna Cross Roads..Clark Couny Med. Soc.
Dye, J. H.....Cleveland..Acad. of Med. of Cleveland.

Eakins, J.....Gallipolis..Gallia County Med. Soc.
Eakman, W. S.....Ironton..Lawrence County Med. Soc.
Early, L. M.....1045 E. Long, Columbus..Columbus Acad. of Med.

Earnshaw, L. P.....1223 W. 5th, Dayton..Montgomery Co. Med. Soc.
Earp, J. F.....Malinta..Henry County Med. Soc.
Eastman, W. H.....Fredericktown..Knox County Med. Soc.
Easton, J. C.....Springfield..Clark County Med. Soc.
Eberhard, L. R. C.....Akron..Summit County Med. Soc.
Ebersole, W. G..15 Bolton ave., Cleveland..Acad. of Med. of Cleveland.
Eddy, C. W.....Marietta..Washington Co. Med. Soc.
Eddy, R. C.....933 Woodland, Cleveland..Acad. of Med. of Cleveland.
Edgington, Chas. W.....West Union..Adams County Med. Soc.
Edmiston, W. E.....Columbus..Columbus Acad. of Med.
Edward, Ed.....Delphos..Allen County Med. Soc.
Edwards, F. M.....Portsmouth..Hempstead Acad. of Med.
Edwards, H.E.,636 Schofield Bldg.,Cleveland..Acad. of Med. of Cleveland.
Edwards, R. C.....Coshocton..Coshocton Co. Med. Soc.
Egar, G. .....470 Bank, Cincinnati..Acad. of Med. of Cincinnati.
Ehret, G. A....Schofield Bldg.,Cleveland..Acad. of Med. of Cleveland.
Eichberg, Jos.....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Eichberg, Julius..17 Garfieldpl., Cincinnati..Acad. of Med. of Cincinnati.
Elder, C. T....968 Parson ave., Columbus..Columbus Acad. of Med.
Elder, J. M.....Mineral Ridge..Trumbull County Med. Soc
Eley, W. L.....Fredericktown..Knox County Med. Soc.
Elliott, James T.....E. Liverpool..Columbiana Co. Med. Soc.
Ellis, Wm. C.....Portsmouth..Hempstead Acad. of Med.
Ellison, Owen.....Ironton..Lawrence County Med. Soc
Ellsworth, E. .....Gallipolis..Gallia County Med. Soc.
Ely, Charles W.....Cheshire..Gallia County Med. Soc.
Ely, Jas. S.....Barnesville..Belmont County Med. Soc.
Ely, Jos. D.....1153 Oak, Toledo..Montgomery Co. Med. Soc.
Emerick, E. J....1126 Neil ave., Columbus..Columbus Acad. of Med.
Emmons, D. R.....N. Lewisburg..Champaign Co. Med. Soc.
Entrikin, F. B.....Findlay..Hancock County Med. Soc.
Erdhaus, F. J.....709 Carr, Cincinnati..Acad. of Med. of Cincinnati.
Erskine, Demarr .....Steubenville..Jefferson County Med. Soc.
Erwin, J. E.....603 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Essington, U. K.....Somerset..Perry County Med. Soc.
Evans, A. E.....145 E. Long, Columbus..Columbus Acad. of Med.
Evans, Chas. S..17 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Evans, Chas. W....Limestone, Springfield..Clark County Med. Soc.
Evans, E. W....1450 N. High, Columbus..Columbus Acad. of Med.
Evans, Geo. B..17 S. Wilkinson, Dayton..Montgomery Co. Med. Soc.
Evans, O.....Franklin..Warren County Med. Soc.
Evans, W. G.....Little Hocking..Washington Co. Med. Soc.
Everett, A. B.....Oberlin..Lorain County Med. Soc.
Everhard, D. L.....N. Harrisburg..Carroll County Med. Soc.

Everhard, E. S...21 S. Wilkinson, Dayton..Montgomery Co. Med. Soc.
Ewing, M. J.....Findlay..Hancock County Med. Soc.
Ewing, Wm. A.....26 N. Perry, Dayton..Montgomery Co. Med. Soc.
Eyestone, A. G.....Gibsonburg..Sandusky County Med. Soc.

Fackler, G. A..112 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Faller, A.....19 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Falls, Wm. H.....522 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Farber, J. H.....207 W. 3rd, Dayton..Montgomery Co. Med. Soc.
Farley, J. T.....Lancaster..Fairfield County Med. Soc.
Farnsworth, G. B..679 Dennison, Cleveland..Acad. of Med. of Cleveland.
Farr, Thos. G.....South Charleston..Clark County Med. Soc.
Farrar, H. D.....195 E. State, Columbus..Columbus Acad. of Med.
Fast, L. R.....Paulding..Paulding County Med. Soc.
Faul, W. L.....Arnheim..Brown County Med. Soc.
Fauster, J. W.....Archbold..Fulton County Med. Soc.
Fee, Frank E....3727 Eastern, Cincinnati..Acad. of Med. of Cincinnati.
Fee, R. B.....Georgetown..Brown County Med. Soc.
Felker, Gertrude..21 S. Wilkinson, Dayton..Montgomery Co. Med. Soc.
Fels, Geo. W...2931 Woodburn, Cincinnati..Acad. of Med. of Cincinnati.
Fennel, O. W....3018 Jefferson, Cincinnati..Acad. of Med. of Cincinnati.
Fife, Frank.....811 E. Fifth, Dayton..Montgomery Co. Med. Soc.
Fihe, Clement....1295 Walnut, Cincinnati..Acad. of Med. of Cincinnati.
Finch, Robt. W.....Defiance..Defiance County Med. Soc.
Finley, W. H.....Xenia..Greene County Med. Soc.
Finnical, F. F.....Dennison..Tuscarawas Co. Med. Soc.
Firmin, F. W.....Findlay..Hancock County Med. Soc.
Firmin, J. M.....Findlay..Hancock County Med. Soc.
Fischer, Robt., 811 Schofield Bldg., Cleveland..Acad. of Med. of Cleveland.
Fisher, J. H.....Malinta..Henry County Med. Soc.
Fishbaugh, M. B.....Wabash..Mercer County Med. Soc.
Fisher, A. W.....815 Erie, Toledo..Acad. of Med. of Toledo and Lucas County.
Fisher, Benj. H.....Steubenville..Jefferson County Med. Soc.
Fisher, H.....Lebanon..Warren County Med. Soc.
Fisher, Philip.....726 Laurel, Cincinnati..Acad. of Med. of Cincinnati.
Fisher, Wm. H.....815 Erie, Toledo..Acad. of Med. of Toledo and Lucas County.
Fitch, Jas. W.....Portsmouth..Hempstead Acad. of Med.
Fitch, M. D.....58 E. Fifth, Columbus..Columbus Acad. of Med.
Fitsimmons, J. F.....Bucyrus..Crawford County Med. Soc.
Fitzgerald, W. T.....Greenville..Darke County Med. Soc.
Fitzpatrick, T. V., 32 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Floyd, J. C. M.....Steubenville..Jefferson County Med. Soc.

Focht, W. H.....Tiffin..Seneca County Med. Soc.
Foertmeyer, C. H..836 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Fogel, Leo. J.....708 Clinton, Cincinnati..Acad. of Med. of Cincinnati.
Folk, P....Deavertown (Muskingum Co.)..Perry County Med. Soc.
Follansbee, Geo. B..2477 B'way, Cleveland..Acad. of Med. of Cleveland.
Foltz, E. B.....Akron..Summit County Med. Soc.
Foote, Chas. G....961 Prospect, Cleveland..Acad. of Med. of Cleveland.
Forchheimer, Fred..Ortiz Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Forchheimer, W..Ortiz Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Ford, C. E.....Osborn Bldg., Cleveland..Acad. of Med. of Cleveland.
Ford, Starr.....504 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Forman, A. J.....Bloom Center..Logan County Med. Soc.
Formorin, J. L.....Marathon..Clermont County Med. Soc.
Forsythe, A. M.....Bridgeport..Belmont County Med. Soc.
Foster, C. A.....Newark..Licking County Med. Soc.
Foster, Ira C.....Wintersville..Clermont County Med. Soc.
Foster, John .....London..Madison County Med. Soc.
Foster, S. D.....111 Madison, Toledo..Acad. of Med. of Toledo and Lucas County.
Foster, Thos.....134 S. Linden, Dayton..Montgomery Co. Med. Soc.
Frame, A. B.....Piqua..Miami County Med. Soc.
Frame, A. C.....Cambridge..Guernsey County Med. Soc.
Frame, J. A.....138 E. State, Columbus..Columbus Acad. of Med.
France, S. W.....Midvale..Tuscarawas Co. Med. Soc.
Francis, A. W.....Ripley..Brown County Med. Soc.
Francis, Jno.....Hamilton..Butler County Med. Soc.
Francis, R. C.....534 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Francis, Wm.....Sedalia..Madison County Med. Soc.
Francisci, M.....765 Lorain, Cleveland..Acad. of Med. of Cleveland.
Franke, F. C....703 Woodland, Cleveland..Acad of Med. of Cleveland.
Fraser, Jno. M.....581 Erie, Cleveland..Acad. of Med. of Cleveland.
Frazier, F. M.....Montpelier..Williams County Med. Soc.
Freeman, Chas. D.....Medina..Medina County Med. Soc.
Freiberg, A. H....706 Walnut, Cincinnati..Acad. of Med. of Cincinnati.
French, E. H.....Hamilton..Butler County Med. Soc.
French, L. H.....Hamilton..Butler County Med. Soc.
Freudenberger, H...1420 Race, Cincinnati..Acad. of Med. of Cincinnati.
Frick, J. M.....Ottawa..Putnam County Med. Soc.
Friedlander, F.....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Friedman, J.....465 St. Clair, Cleveland..Acad. of Med. of Cleveland.
Friedrich, M.....City Hall, Cleveland..Acad. of Med. of Cleveland.
Friend, Jno. M.....1065 Pearl, Cleveland..Acad. of Med. of Cleveland.
Fritch, J. C.....330 Pearl, Cleveland..Acad. of Med. of Cleveland.
Fritz, J. H.....West Alexandria..Preble County Med. Soc.

Frizell, J. S.....Buena Vista..Scioto County Med. Soc.
Frost, F. H.....Lebanon..Warren County Med. Soc.
Fry, R. D.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Fullerton, E. B....129 E. State, Columbus..Columbus Acad. of Med.
Fulton, M. C.....Portsmouth..Hempstead Acad. of Med.
Fulwider, R. M.....West Liberty..Logan County Med. Soc.
Funk, H. H.....Beverly..Washington Co. Med. Soc.
Funk, M. F.....Mowrystown..Highland County Med. Soc.

Gage, F. L.....Delaware..Delaware County Med. Soc.
Gain, C. E.....London..Madison County Med. Soc.
Gaither, A....41 Groton Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Gale, Geo. T.....Newport..Washington Co. Med. Soc.
Gallagher, C. A.....Marietta..Washington Co. Med. Soc.
Gallagher, C. C.....Pinegrove..Gallia County Med. Soc.
Gallagher, C. T.....Mt. Sterling..Madison County Med. Soc.
Galloway, C. M.....Xenia..Greene County Med. Soc.
Galloway, W. A.....Xenia..Greene County Med. Soc.
Garbold, A. A.....Greenville..Darke County Med. Soc.
Gardiner, H. E.....Clayton..Montgomery Co. Med. Soc.
Gardiner, J.....Erie & Mulberry, Toledo..Acad. of Med. of Toledo and Lucas County.
Gardiner, Wm. G.....1455 Erie, Toledo..Acad. of Med. of Toledo and Lucas County.
Gardner, W. D.....Plain City..Madison County Med. Soc.
Garlick, H. S..32 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati
Garver, A. N.....Lorain..Lorain County Med. Soc.
Garver, Chas. V.....Lorain..Lorain County Med. Soc.
Garvin, E. C....2728 Broadway, Cleveland..Acad. of Med. of Cleveland.
Gaston, E. M.....West Union..Adams County Med. Soc.
Gatch, Con W.....Milford..Clermont County Med. Soc.
Gates, E. S.....4841 Eastern, Cincinnati..Acad. of Med. of Cincinnati
Gau, H. F.....Reading Road, Cincinnati..Acad. of Med. of Cincinnati.
Gaugler, R. S.....219 W. 3rd, Dayton..Montgomery Co. Med. Soc.
Gaus, P. T.....West Florence..Preble County Med. Soc.
Gavin, Wm. J.....908 Clark, Cincinnati..Acad. of Med. of Cincinnati
Gawne, A. J.....Sandusky..Erie County Med. Soc.
Gehrett, T. M.....Deshler..Henry County Med. Soc.
Geier, O. P....124 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Gentsch, Chas.....167 Franklin, Cleveland..Acad. of Med. of Cleveland.
George, O. E.....1207 Pearl, Cleveland..Acad. of Med. of Cleveland.
George, T. J.....Okeana..Butler County Med. Soc.
Geyer, J. D.....Sidney..Shelby County Med. Soc.
Geyer, Jos. L.....Norwich..Muskingum Co. Med. Soc.

Gibbon, H. B.....Tiffin..Seneca County Med. Soc.
Gibson, H. G.....Glouster..Athens County Med. Soc.
Gibson, J. T.....Lynchburg..Highland County Med. Soc.
Giesey, E. R.....Toronto..Jefferson County Med. Soc.
Gilbert, J. R.....Lorain..Lorain County Med. Soc.
Gillespie, P.....Wyoming..Hamilton County Med. Soc.
Gillette, A. E....2456 Eastern, Cincinnati..Acad. of Med. of Cincinnati.
Gillette, Wm. T....1613 Jefferson, Toledo..Acad. of Med. of Toledo and Lucas County.
Gilliam, D. T.....50 N. 4th, Columbus..Columbus Acad. of Med.
Gilliam, E. M.....50 N. 4th, Columbus..Columbus Acad. of Med.
Gillispie, Wm. F.....670 June, Cincinnati..Acad. of Med. of Cincinnati.
Girardot, A. J....Cherry-Bancroft, Toledo..Acad. of Med. of Toledo and Lucas County.
Glasgow, Jos. A.....Deaman..Adams County Med. Soc.
Glass, J. O.....Springfield..Clark County Med. Soc.
Gleaser, B. L.,Odd Fellows Bldg.,Cincinnati..Acad. of Med. of Cincinnati.
Geissinger, H. W.....Grove City..Franklin County Med. Soc.
Goetz, F. E.....581 Woodland, Cleveland..Acad. of Med. of Cleveland.
Goff, W. M.....Unionville Center..Union County Med. Soc.
Goheen, Chas. M.....Continental..Putnam County Med. Soc.
Gohn, Geo. D.....1019 Wayne, Dayton..Montgomery Co. Med. Soc.
Goldsmith, M. A..Willson ave., Cleveland..Acad. of Med. of Cleveland.
Good, I. Q.....Bellevue..Huron County Med. Soc.
Good, P. W.....2135 Vine, Cincinnati..Acad. of Med. of Cincinnati.
Goode, B. P....1812 Baymiller, Cincinnati..Acad. of Med. of Cincinnati.
Goodhue, Geo.....133 N. Perry, Dayton..Montgomery Co. Med. Soc.
Gooding, Jno. J.....Gilmore..Tuscarawas Co. Med. Soc.
Goodman, S. J....328 E. State, Columbus..Columbus Acad. of Med.
Goodrich, G. I.....Canal Dover..Tuscarawas Co. Med. Co.
Goodwin, E. M.....Glenville..Acad. of Med. of Cleveland.
Gorden, Thos. G.....New Philadelphia..Tuscarawas Co. Med. Soc.
Gordon, Jno. F.....Otway..Scioto County Med. Soc.
Gordon, Jno. L....2555 N. High, Columbus..Columbus Acad. of Med.
Gordon, J. W.....Bowerstown..Harrison County Med. Soc.
Gordon, P. A.....Junction City..Perry County Med. Soc.
Gores, C. F....2928 Hackberry, Cincinnati..Acad. of Med. of Cincinnati.
Gorsuch, N.....Center Village..Delaware County Med. Soc.
Goss, C. W.....Lancaster..Fairfield County Med. Soc.
Goss, J. H.....Lancaster..Fairfield County Med. Soc.
Gotwald, D. K..Gotwald Bldg., Springfield..Clark County Med. Soc.
Gould, E. P.....Sheridan..Lawrence County Med. Soc.
Gowing, W. A.....338 Summit, Toledo..Acad. of Med. of Toledo and Lucas County.

Graefe, Chas.....Sandusky..Erie County Med. Soc.
Graefe, Wm. .....Sandusky..Erie County Med. Soc.
Graham, Frank .....Lisbon..Columbiana Co. Med. Soc.
Granger, F. M.....Russell..Highland County Med. Soc.
Granger, Robt. .....Dayton..Montgomery Co. Med. Soc.
Grant, J. C.....Akron..Summit County Med. Soc.
Gray, C. G.....Ironton..Lawrence County Med. Soc.
Gray, Dan.....Ironton..Lawrence County Med. Soc.
Gray, F. C.....1428 E. 3rd, Dayton..Montgomery Co. Med. Soc.
Green, A. F.....Lilly Chapel..Madison County Med. Soc.
Green, Duff W.....114 W. 3rd, Dayton..Montgomery Co. Med. Soc.
Green, H. L.....2542 Fulton, Toledo..Acad. of Med. of Toledo and Lucas County.
Green, Myron D..3015 W. 6th, Cincinnati..Acad. of Med. of Cincinnati.
Green, P. W.....Columbus..Columbus Acad. of Med.
Greenfield, E. J..418 Spitzer Bldg., Toledo..Acad. of Med. of Toledo and Lucas County.
Gregg, M.....Smithfield..Jefferson County Med. Soc.
Gregory, Wm. M.....Berea..Acad. of Med. of Cleveland.
Greiwe, Jno. E..1344 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Griep, O. E.....131 E. Xenia ave., Dayton..Montgomery Co. Med. Soc.
Griess, W. R.....14 E. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Griffith, W. L.....Pedro..Lawrence County Med. Soc.
Grim, A.....44 E. McMickin, Cincinnati..Acad. of Med. of Cincinnati.
Grimes, R. L.....Westerville..Franklin County Med. Soc.
Grosvenor, P. W.....Piqua..Miami County Med. Soc.
Grothaus, Jno. B.,1623 Baymiller, Cincin'ti..Acad. of Med. of Cincinnati.
Groves, A. C.....Jewett..Harrison County Med. Soc.
Groves, J. L.....Andrews..Morrow County Med. Soc.
Groves, Jno. E.....Uhrichsville..Tuscarawas Co. Med. Soc.
Grube, R. H.....Grape Grove..Greene County Med. Soc.
Grube, Wm. W..1502 Collingwood, Toledo..Acad. of Med. of Toledo and Lucas County.
Gunckel, P. L.....214 Jefferson, Dayton..Montgomery Co. Med. Soc.
Gundrum, W. H.....2041 Erie, Toledo..Acad. of Med. of Toledo and Lucas County.
Gunsolly, Wm. N.....Collinwood..Acad. of Med. of Cleveland.
Guntrum, W. E.....Greenville..Darke County Med. Soc.
Guthrie, Jno. W.....Manchester..Adams County Med. Soc.

Haag, H. P.....Liberty Center..Henry County Med. Soc.
Haas, J. F.....West Mansfield..Logan County Med. Soc.
Haefele, Geo. L.....670 Clark, Cleveland..Acad. of Med. of Cleveland.
Haile, Geo. W...3rd & B'dway, Cincinnati..Acad. of Med. of Cincinnati.

Hain, C. O.....704 Scranton, Cleveland..Acad. of Med. of Cleveland
Haines, W. D....1006 Freeman, Cincinnati..Acad. of Med. of Cincinnati.
Halderman, H. G.....Portsmouth..Hempstead Acad. of Med.
Halderman, S. S.....Portsmouth..Hempstead Acad. of Med.
Hale, Paul D.....5th & Ludlow, Dayton..Montgomery Co. Med. Soc.
Hall, B. P.....Richwood..Union County Med. Soc.
Hall, E. M.....Delaware..Delaware County Med. Soc.
Hall, Jos. A.....2513 Auburn, Cincinnati..Acad. of Med. of Cincinnati.
Hall, Loren.....Portsmouth..Hempstead Acad. of Med.
Hall, R. B.....628 Elm, Cincinnati..Acad. of Med. of Cincinnati
Halleck, F. D.....Bowling Green..Wood County Med. Soc.
Haly, J. S.....Napoleon..Henry County Med. Soc.
Hamann, C. A....661 Prospect, Cleveland..Acad. of Med. of Cleveland
Hamer, Wm. W.....Bellefontaine..Logan County Med. Soc.
Hamilton, Chas. S....1 N. 4th, Columbus..Columbus Acad. of Med.
Hamilton, D. B.....Mason..Warren County Med. Soc.
Hamilton, E. A....860 E. Main, Columbus..Columbus Acad. of Med.
Hamilton, H. M...1739 S. High, Columbus..Columbus Acad. of Med.
Hamilton, L. D.....E. Center, Marion..Marion County Med. Soc.
Hamilton, Wm. W.....E. Liverpool..Columbiana Co. Med. Soc.
Hamlin, Geo. E....4 Adams Blk., Toledo..Acad. of Med. of Toledo and Lucas County.
Hamma, Chas. B..1130 Dayton, Cincinnati..Acad. of Med. of Cincinnati
Hammond, J. W.....Wellsville..Columbiana Co. Med. Soc.
Hampshire, J. F.....St. Paris..Champaign Co. Med. Soc.
Hampton, N. B..40 E. McMillen, Cincin'ti..Acad. of Med. of Cincinnati
Handerson, H. E..444 Dunham, Cleveland..Acad. of Med. of Cleveland
Handley, D. C..21 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati
Haning, H. C....117 S. Ludlow, Dayton..Montgomery Co. Med. Soc.
Hanna, C. U.....Zanesville..Muskingum Co. Med. Soc.
Hannah, R. B.....Georgetown..Brown County Med. Soc.
Hannum, B. G..710 Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Hannum, E. S..1501 Clark ave., Cleveland..Acad. of Med. of Cleveland.
Hanson, D. S...1419 Broadway, Cleveland..Acad. of Med. of Cleveland
Hanson, J. T.....Gallipolis..Gallia County Med. Soc.
Harding, Geo. T..State Hosp., Columbus..Columbus Acad. of Med.
Harding, H. A.....Kilgore..Carroll County Med. Soc.
Harmon, F. W., Long View Asy'm, Cincin'ti..Acad. of Med. of Cincinnati
Harmon, G. A.....Lancaster..Fairfield County Med. Soc.
Harpster, C. M...Erie & Madison, Toledo..Acad. of Med. of Toledo and Lucas County.
Harris, C. H.....Lowell..Washington Co. Med. Soc.
Harris, E. C.....67 E. High, Springfield..Clark County Med. Soc.
Harris, H. L....102 Sycamore, Columbus..Columbus Acad. of Med.

Harris, J. A. L.....Drusilla..Putnam County Med. Soc.
Harris, Jas..286 W. McMicken, Cincinnati..Acad. of Med. of Cincinnati
Harris, Jno. H.....Clifton..Greene County Med. Soc.
Harris, W. P.....Shadyside..Belmont County Med. Soc.
Harris, Wm. C..43 Groton Bldg., Cincin'ti..Acad. of Med. of Cincinnati.
Harrison, Chas. M.....Napoleon..Henry County Med. Soc.
Harrison, E. B., Life member....Napoleon..Henry County Med. Soc.
Harrison, F. M.....Napoleon..Henry County Med. Soc.
Harrison, F. R.....E. Liverpool..Columbiana Co. Med. Soc.
Harrod, C. L.....135 E. State, Columbus..Columbus Acad. of Med.
Harsh, H. E.....Magnolia..Stark County Med Soc.
Hart, A. G.....102 Jennings, Cleveland..Acad. of Med. of Cleveland.
Hart, Benj. F., Life member.....Marietta..Washington Co. Med. Soc.
Hart, Samuel.....Marietta..Washington Co. Med. Soc.
Hart, Thos. B.....533 E. Fifth, Cincinnati..Acad. of Med. of Cincinnati
Hart, W. E.....Elyria..Lorain County Med. Soc.
Hartford, R. S.....E. Palestine..Columbiana Co. Med. Soc.
Hartley, F. A.....Byhalia..Union County Med. Soc.
Hartman, Geo. W.....Wauseon..Fulton County Med. Soc.
Hartman, S. D.....Tippecanoe..Harrison County Med. Soc.
Hartzel, H. J..584 W. Madison, Clevelanc..Acad of Med. of Cleveland
Hasencamp, O.....Cherry, Toledo..Acad. of Med. of Toledo and Lucas County.
Haskins, H. D....2070 Detroit, Cleveland..Acad. of Med. of Cleveland
Hatch, Chas. A.....Newark..Licking County Med. Soc.
Hatcher, H. H.....4th st., Dayton..Montgomery Co. Med. Soc
Hathaway, J. J.....Carrollton..Carroll County Med. Soc.
Hattery, J. E.....Celina..Mercer County Med. Soc.
Hatton, E. M..Hotel Vendome, Columbus..Columbus Acad. of Med.
Hauesser, E. G., 793 E. McMillen, Cincin'ti..Acad. of Med. of Cincinnati
Havens, H. H.....Tippecanoe..Harrison County Med. Soc.
Havlicek, F. J.....133 Root, Cleveland..Acad. of Med. of Cleveland.
Hawes, S. A.....Greenville..Darke County Med. Soc.
Hawk, P.....Athens..Athens County Med. Soc.
Hawley, C. A.....New Paris..Preble County Med. Soc.
Hawley, C. M.....Painesville,..Lake County Med. Soc.
Hay, Chas. H.....2049 Detroit, Cleveland..Acad. of Med. of Cleveland.
Hayes, Thos. W.....1814 Vine, Cincinnati..Acad. of Med. of Cincinnati
Haynes, J. T.....Sandusky..Erie County Med. Soc.
Hays, Samuel B.....N. Comerstown..Tuscarawas Co. Med. Soc.
Hazelton, H. M.....Lancaster..Fairfield County Med. Soc.
Headley, A. B.....Cambridge..Guernsey County Med. Soc
Heady, T.....Glendale..Hamilton County Med. Soc.
Heath, H. H.....275 Prospect, Cleveland..Acad. of Med. of Cleveland.

Heath, J. A.....10 Marquette, Cleveland..Acad. of Med. of Cleveland.
Heath, J. M. S.....Bellaire..Belmont County Med. Soc.
Hebble, Robt. C.....Enon..Clark County Med. Soc.
Hecker, E. A.....Greenville..Darke County Med. Soc.
Hecker, L.....905 S. Wayne, Dayton..Montgomery Co. Med. Soc.
Hedges, J. S.....Mansfield..Richland County Med. Soc.
Hedges, W. B.....Delaware..Delaware County Med. Soc.
Hedrick, J. S.....Dunkirk..Hardin County Med. Soc.
Heffron, Chas. H.....Metamora..Fulton County Med. Soc.
Heidingsfeld, M. L....222 7th, Cincinnati..Acad. of Med. of Cincinnati.
Heidler, Geo. K..573 Kinsman, Cleveland..Acad. of Med. of Cleveland.
Heimlich, D....661 Woodland, Cleveland..Acad. of Med. of Cleveland.
Heinlein, A.....Bridgeport..Belmont County Med. Soc.
Heise, O. N....16 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Held, C. E.....Akron..Summit County Med. Soc.
Held, H. F.....1901 Vine, Cincinnati..Acad. of Med. of Cincinnati.
Helfrich, E. D.....Galion..Crawford County Med. Soc.
Heller, Fred .....Oak Harbor..Ottawa County Med. Soc.
Hellman, F. F..1327 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Helms, F. G.....Uhrichsville..Tuscarawas Co. Med. Soc.
Heltman, E. W..10 Hartford Blk., Toledo..Acad. of Med. of Toledo and Lucas County.
Hendershot, B. C.....New Philadelphia..Tuscarawas Co. Med. Soc.
Hendershot, O. M.....E. Liverpool..Columbiana Co. Med. Soc.
Hendershott, R. R.....Tiffin..Seneca County Med. Soc.
Henderson, A. M.....Roscoe..Coshocton Co. Med. Soc.
Henderson, D. W.....Marysville..Union County Med. Soc.
Henderson, D. W.,Life member, Marysville..Union County Med. Soc.
Henderson, R.....Urbana..Champaign Co. Med. Soc.
Henderson, Robt.....Urbana..Champaign Co. Med. Soc.
Hendley, F. W.., 785 E. McMillen, Cincin'ti..Acad. of Med. of Cincinnati.
Hendren, S. E.....922 S. Wayne, Dayton..Montgomery Co. Med. Soc.
Hendrixon, O. S....186 W. 5th, Columbus..Columbus Acad. of Med.
Hendrixson, O. P.....Yellow Springs..Greene County Med. Soc.
Henkel, G. C.....Farmersville..Montgomery Co. Med. Soc.
Henning, E. R.....West Liberty..Logan County Med. Soc.
Henry, F. R.....140 W. 4th, Dayton..Montgomery Co. Med. Soc.
Henry, J. L.....Athens..Athens County Med. Soc.
Henry, W. H. .....Hamden Junction..Vinton County Med. Soc.
Henry, Z. L.....Amesville..Athens County Med. Soc.
Hensel, C. M.....Lithopolis..Fairfield County Med. Soc.
Henzler, Chas. J..714 E. Bancroft, Toledo..Acad. of Med. of Toledo and Lucas County.
Herbert, J. L.....Hanoverton..Columbiana Co. Med. Soc.

Hermann, G. A.....Hamilton..Butler County Med. Soc.
Herrick, F. C.....367 Erie, Cleveland..Acad. of Med. of Cleveland.
Herrick, H. B.....2531 Euclid, Cleveland..Acad. of Med. of Cleveland.
Herrick, H. J.....112 Lennox, Cleveland..Acad of Med. of Cleveland
Herrick, W. H.....176 Euclid, Cleveland..Acad of Med. of Cleveland
Hersh, E. G.....McComb..Hancock County Med. Soc.
Hess, Jno. L..444 Wade Park, Cleveland..Acad of Med. of Cleveland
Heston, E. N.....Thurston..Fairfield County Med. Soc.
Heston, H. M.....Baltimore..Fairfield County Med. Soc.
Heston, J. L.....Pataskala..Licking County Med. Soc.
Hewetson, J. E.....Amanda..Fairfield County Med. Soc.
Hewitson, A. H.....St. Clairsville..Belmont County Med. Soc.
Hewitson, E. S.....St. Clairsville..Belmont County Med. Soc.
Heyl, A. B.....Madison road, Cincinnati..Acad. of Med. of Cincinnati
Heyn, Louis.....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati
Hick, Stanton.....Salem..Columbiana Co. Med. Soc.
Hickey, W. D.....Leipsic..Putnam County Med. Soc.
Hickey, W. H.....Leipsic..Putnam County Med. Soc.
Hickin, F. W.....342 Jennings, Cleveland..Acad of Med. of Cleveland
Hiddleson, C. S.....Akron..Summit County Med. Soc.
Hiestand, C. M.....65 High, Springfield..Clark County Med. Soc.
Hiestand, E. B.....Kenton..Hardin County Med. Soc.
Hiestand, H. E.....Kenton..Hardin County Med. Soc.
Hiestand, H. L.....Donnelsville..Clark County Med. Soc.
Higgins, Chas. H.....Sonora..Muskingum Co. Med. Soc.
Hill, Anna M.....Zanesville..Muskingum Co. Med. Soc.
Hill, C. T.....Akron..Summit County Med. Soc.
Hill, E. W.....Glenville..Acad of Med. of Cleveland
Hill, W. H..Lake Side Hospital, Cleveland..Acad of Med. of Cleveland
Hiller, Carl R.....706 Walnut, Cincinnati..Acad. of Med. of Cincinnati.
Hillkowitz, Wm.....704 Race, Cincinnati..Acad. of Med. of Cincinnati.
Hilton, W. S.....Pleasant Bend..Henry County Med. Soc.
Hinckley, H. D....211 W. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Hiner, S. B.....Lima..Allen County Med. Soc.
Hines, H. H....34 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Hise, A. H.....Carrollton..Carroll County Med. Soc.
Hitchcock, J. L.....Uhrichsville..Tuscarawas Co. Med. Soc.
Hobbs, W. A.....E. Liverpool..Columbiana Co. Med. Soc.
Hobson, A. B.....Flushing..Belmont County Med. Soc.
Hobson, Jno. A.....Flushing..Belmont County Med. Soc.
Hobson, J. F.....Lakewood..Acad of Med. of Cleveland.
Hobson, W. S.....2338 Euclid, Cleveland..Acad of Med. of Cleveland.
Hochwalt, G. A.....342 S. Main, Dayton..Montgomery Co. Med. Soc.
Hocker, E....1032 Wesley ave., Cincinnati..Acad. of Med. of Cincinnati.

Hodkins, J. A.....Russellville..Brown County Med. Soc.
Hodlan, G. W....201 E. Long, Columbus..Columbus Acad. of Med.
Hodling, A.....1201 Harrison, Cincinnati..Acad. of Med. of Cincinnati.
Hoege, G. L.....Fostoria..Seneca County Med. Soc.
Hogue, W. L.....Montpelier..Williams County Med. Soc.
Holbrook, W. C.....McLuney..Perry County Med. Soc.
Holcomb, C. B.....Corning..Perry County Med. Soc.
Hole, Chas. M..300 Cedar ave., Cleveland..Acad of Med. of Cleveland.
Holland, A. B.....Wellsville..Columbiana Co. Med. Soc.
Holliday, B. W., Euclid & Russell, Cleveland..Acad of Med. of Cleveland.
Holliday, Wm. W., 30 Miles Park, Cleveland..Acad of Med. of Cleveland
Holmes, C. R.....8 E. 8th, Cincinnati..Acad. of Med. of Cincinnati
Holmes, Geo...688 W. Madison, Cleveland..Acad of Med. of Cleveland
Holmes, H. F.....Albany..Athens County Med. Soc.
Holmes, Jas. E.....Agosta..Marion County Med. Soc.
Holmes, R. E.....Leesburg..Highland County Med. Soc
Holmes, R. W.....Gallipolis..Gallia County Med. Soc.
Holst, E. B.....Rossford..Wood County Med. Soc.
Holt, Oliver P....134 W. 9th, Cincinnati..Acad. of Med. of Cincinnati
Homes, W. W.....Columbus..Columbus Acad. of Med.
Hooven, Warren E..5th & Henry, Dayton..Montgomery Co. Med. Soc
Hoover, D. E.....Warren..Trumbull County Med. Soc
Hoover, H. H.....Laura..Miami County Med. Soc.
Hoover, K.....Defiance..Defiance County Med. Soc.
Hoover, Thos. C...249 E. State, Columbus..Columbus Acad. of Med.
Hopkins, D. N.....Friendship..Scioto County Med. Soc.
Hoppe, H. H...32 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati
Hornung, F. G.....Hamilton..Butler County Med. Soc.
Hosford, J. H.....Paulding..Paulding County Med. Soc
Hosick, W. A..1613 Woodland, Cleveland..Acad. of Med. of Cleveland
Hosick, W. R.....New Comerstown..Tuscarawas Co. Med. Soc.
Hosteler, C. E.....Pt. Pleasant..Clermont County Med. Soc
Hottendorf, L. P..810 Richmond, Cincin'ti..Acad. of Med. of Cincinnati
Houck, E. O.....361 Dunham, Cleveland..Acad. of Med. of Cleveland
Hough, Chas. A.....Lebanon..Warren County Med. Soc.
Hous, Geo. W.....1330 N. Main, Dayton..Montgomery Co. Med. Soc
House, A. F.....2020 Euclid, Cleveland..Acad. of Med. of Cleveland.
House, Chas. F.....Painesville..Lake County Med. Soc.
House, L. F.....Rainsboro..Highland County Med. Soc
Houser, D. C.....Millerstown..Champaign Co. Med. Soc.
Hover, Wm. E.....Lima..Allen County Med. Soc.
Howard, J. M.....Amesville..Athens County Med. Soc.
Howard, W. T.,Jr.,88 Dorchester, Cleveland..Acad. of Med. of Cleveland.

Howe, Jos. D....205 Wayne Bldg., Toledo..Acad. of Med. of Toledo and Lucas County.
Howell, C. A.....70 W. 1st, Columbus..Columbus Acad. of Med.
Howell, J. G.....Freeport..Harrison Co. Med. Soc.
Howell, J. M.....Reibold Bldg., Dayton..Montgomery Co. Med. Soc.
Howell, R. A.....Patriot..Gallia County Med. Soc.
Howell, W. E.....Rio Grande..Gallia County Med. Soc.
Howells, Jas. O.....Bridgeport..Belmont County Med. Soc.
Howland, A. P....1174 Willson, Cleveland..Acad. of Med. of Cleveland.
Hubbard, Thos.....205 Ontario, Toledo..Acad. of Med. of Toledo and Lucas County.
Hubbell, W. B.....Elyria..Lorain County Med. Soc.
Huddle, G. R.....Stoutsville..Fairfield County Med. Soc.
Hudson, C. O.....Painesville..Lake County Med. Soc.
Huffman, D. C., Nat. Military Home, Dayton..Montgomery Co. Med. Soc.
Hufford, J. T.....Clearport..Fairfield County Med. Soc.
Huggins, T. A.....Sparta..Morrow County Med. Soc.
Hughes, D. E.....Delaware..Hancock County Med. Soc.
Hughes, Don C.....Findlay..Hancock County Med. Soc.
Hughes, Lot H.....Dennison..Tuscarawas Co. Med. Soc.
Hulse, J. O.....Akron..Summit County Med. Soc.
Humiston, Wm. H..Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Humphrey, C. M.....Akron..Summit County Med. Soc.
Humphrey, H. B.....Akron..Summit County Med. Soc.
Humphrey, W. H.....Yellow Springs..Greene County Med. Soc.
Humphreys, C. H..1st & Jefferson, Dayton..Montgomery Co. Med. Soc.
Hunt, H. B.....St. Paris..Champaign Co. Med. Soc.
Hunt, W. M.....Bellpoint..Delaware County Med. Soc.
Hunter, A. C.....West Alexandria..Preble County Med. Soc.
Huntley, J. H.....Lima..Allen County Med. Soc.
Hurd, Anson, Life member.....Findlay..Hancock County Med. Soc.
Hurst, W. B.....Piketon..Pike County Med. Soc.
Hussey, M. F.....Sidney..Shelby County Med. Soc.
Husted, E. G.....Greenville..Darke County Med. Soc.
Huston, A. L.....Bellefontaine..Logan County Med. Soc.
Huston, C. E.....Rushsylvania..Logan County Med. Soc.
Huston, C. N.....Hamilton..Butler County Med. Soc.
Huston, E. M....28 N. Wilkinson, Dayton..Montgomery Co. Med. Soc.
Hutchings, S. R....258 High, Springfield..Clark County Med. Soc.
Hutchins, F. C...Jennings ave., Cleveland..Acad. of Med. of Cleveland.
Hutchinson, F. K.....Wellsville..Columbiana Co. Med. Soc.
Hutt, Austin.....Waverly..Pike County Med. Soc.
Huyck, Emery.....Oakharbor..Ottawa County Med. Soc.
Hyde, A. F.....Shelby..Richland County Med. Soc.

Hyde, J. M.....Nelsonville..Athens County Med. Soc.
Hyde, W. H...247 W. Madison, Cleveland..Acad. of Med. of Cleveland.
Hyndman, J. G.....22 W. 9th, Cincinnati..Acad. of Med. of Cincinnati.

Ickes, Edgar.....Fremont..Sandusky County Med. Soc.
Iddings, A. H.....129 S. Brown, Dayton..Acad. of Med. of Cincinnati
Iddings, Geo. S...Caxton Bldg., Cleveland..Acad. of Med. of Cleveland
Iden, O. L.....Somerset..Perry County Med. Soc.
Iford, D. W.....313 Cherry, Toledo..Acad. of Med. of Toledo and Lucas County.
Iglauer, Samuel.....222 7th, Cincinnati..Acad. of Med. of Cincinnati
Igo, C. W.....Payne..Paulding County Med. Soc.
Ihle, C.....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati
Ikirt, Geo. P.....E. Liverpool..Columbiana Co. Med. Soc.
Iliff, Chas. E.....122 W. 7th, Cincinnati..Acad. of Med. of Cincinnati
Ingalls, H. A.....628 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Ingersoll, A. J.....Mentor..Lake County Med. Soc.
Ingersoll, Jno. M..50 Euclid, Cleveland..Acad. of Med. of Cleveland.
Ingram, Robt.....514 Clark, Cincinnati..Acad. of Med. of Cincinnati
Inoberstagg, C. O...Western ave., Toledo..Acad. of Med. of Toledo and Lucas County.
Ireton, E. C.....Marathon..Clermont County Med. Soc.
Irwin, R. W. E.....Manchester..Adams County Med. Soc.
Isham, Asa B.....849 Oak, Cincinnati..Acad. of Med. of Cincinnati.

Jackson, J. H.....Edison..Morrow County Med. Soc.
Jackson, T. W.....Akron..Summit County Med. Soc.
Jacobs, E.....28 Findlay, Cincinnati..Acad. of Med. of Cincinnati
Jacobs, H. H.....Akron..Summit County Med. Soc.
Jacobs, W. C.....Akron..Summit County Med. Soc.
Jacobson, Julius H..709 Madison, Toledo..Acad. of Med. of Toledo and Lucas County.
James, A. D.....Mt. Gilead..Morrow County Med. Soc.
James, Frank .....Deersville..Harrison Co. Med. Soc.
James, J. K.....Delaware..Delaware County Med. Soc.
James, Wm. S.....519½ Lorain, Cleveland..Acad. of Med. of Cleveland.
Jaster, C. O., 207 Cuyahoga Bldg., Cleveland..Acad. of Med. of Cleveland.
Jefferson, T. E.....Danville..Knox County Med. Soc.
Jelke, Wm. F.....Cincinnati..Acad. of Med. of Cincinnati.
Jenkins, A. A....91 White ave., Cleveland..Acad. of Med. of Cleveland.
Jenkins, D. J.....Broadway..Union County Med. Soc.
Jenkins, M. J.....Plain City..Madison County Med. Soc.
Jennings, G.....West Milton..Miami County Med. Soc.
Jerome, M. A., Franklin & Bancroft, Toledo..Acad. of Med. of Toledo and Lucas County.

Jewett, H. J., Life member, 15 W. Monume, Dayton..Montgomery Co. Med. Soc
Johns, John .....Martins Ferry..Belmont County Med. Soc.
Johnson, F. L.....Worthington..Franklin County Med. Soc.
Johnston, C. E.....Sidney..Shelby County Med. Soc.
Johnston, E. A....412 Everett, Cincinnati..Acad. of Med. of Cincinnati
Johnston, J. A....412 Everett, Cincinnati..Acad. of Med. of Cincinnati
Johnstone, A. M., 32 Lexington, Columbus..Acad. of Med. of Cincinnati.
Johnstone, A. W..Madisonville, Cincinnati..Acad. of Med. of Cincinnati
Johnstone, C. E.....E. Palestine..Columbiana Co. Med. Soc
Jones, A. L.....Lima..Allen County Med. Soc.
Jones, D. J.....Salineville..Columbiana Co. Med. Soc.
Jones, Grace.....305 Wayne, Toledo..Acad. of Med. of Toledo and Lucas County.
Jones, H. S.....E. Main, Columbus..Columbus Acad. of Med.
Jones, I. D..1014 E. McMillen, Cincinnati..Acad. of Med. of Cincinnati
Jones, Jno. D....1695 Harvard, Cleveland..Acad. of Med. of Cleveland.
Jones, John A.....424 Willson, Cleveland..Acad. of Med. of Cleveland.
Jones, John D., Life member.....Cleveland..Acad. of Med. of Cleveland.
Jones, L. M.....Jamestown..Greene County Med. Soc.
Jones, L. S.....Medina..Medina County Med. Soc.
Jones, M. M.....Cleveland..Acad. of Med. of Cleveland.
Jones, N. M.....162 Taylor, Cleveland..Acad. of Med. of Cleveland.
Jones, R. C....2373 Park ave., Cincinnati..Acad. of Med. of Cincinnati
Jones, R. E., Life member.....Gomer..Allen County Med. Soc.
Jones, Sidney.....1635 Harvard, Cleveland..Acad. of Med. of Cleveland.
Jones, T. K.....Radnor..Delaware County Med. Soc
Jones, T. W., Life member.....Columbus..Columbus Acad. of Med.
Jones, W. S. .....Waverly..Pike County Med. Soc.
Joseph, L. L.....803 Race, Cincinnati..Acad. of Med. of Cincinnati.
Judkins, E. S.....Highland..Highland County Med. Soc
Judkins, W. L.....Barnesville..Belmont County Med. Soc
Judkins, Wm..122 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati
Judy, Chas. S.....Miamisburg..Montgomery Co. Med. Soc.
Juler, E. C.....12 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Junkerman, G. S..231 W. Court, Cincinnati..Acad. of Med. of Cincinnati

Kaestlen, Samuel E..50 McLean, Cleveland..Acad. of Med. of Cleveland.
Kahn, Max..698 Woodland ave., Cleveland..Acad. of Med. of Cleveland.
Kaler, A. F..Pk. View Sanit'm, Columbus..Columbus Acad. of Med.
Kattenhorn, H. F...814 E. 3rd, Cincinnati..Acad. of Med. of Cincinnati.
Kautz, F. A.....1222 Walnut, Cincinnati..Acad. of Med. of Cincinnati.
Kay, C. H.....40 W. High, Springfield..Clark County Med. Soc.
Kay, Isaac.....40 W. High, Springfield..Clark County Med. Soc.

Kaylor, F. B.....Metamora..Fulton County Med. Soc.
Keator, Warren B.....Findlay..Hancock County Med. Soc.
Keelor, Theo. E.....Lebanon..Warren County Med. Soc.
Keever, B. W. D.....Centerville..Montgomery Co. Med. Soc.
Kehoe, E. T.....Cincinnati..Acad. of Med. of Cincinnati.
Kehuon, Ed.....1930 Central, Cincinnati..Acad. of Med. of Cincinnati.
Keller, Jno. G....2 Adams Bldg., Toledo..Acad. of Med. of Toledo and Lucas County.
Keller, Lester.....Ironton..Lawrence County Med. Soc.
Keller, Thos. F.....423 Spitzer, Toledo..Acad. of Med. of Toledo and Lucas County.
Kelley, Jas. F...State Hospital, Cleveland..Acad. of Med. of Cleveland.
Kelley, S. W....1150 Superior, Cleveland..Acad. of Med. of Cleveland.
Kelly, W. J.....Piqua..Miami County Med. Soc.
Kemp, Lucia.....Bucyrus..Crawford County Med. Soc.
Kendell, B. J.....Tippecanoe City..Miami County Med. Soc.
Kendell, H. W.....Covington..Miami County Med. Soc.
Kendell, Jacob.....Covington..Miami County Med. Soc.
Kendig, W. C..Longview Asy'm, Cincin'ti..Acad. of Med. of Cincinnati.
Kennedy, C. B.....Findlay..Hancock County Med. Soc.
Kennedy, Phillip.....Laurel..Clermont County Med. Soc.
Kenning, H.....Willoughby..Lake County Med. Soc.
Kent, F. M.....Spring Valley..Greene County Med. Soc.
Kerr, I. J.....26 Hough ave., Cleveland..Acad. of Med. of Cleveland.
Kerruish, M. G.....1014 Euclid, Cleveland..Acad. of Med. of Cleveland.
Kidd, Robt. A.....Columbus..Columbus Acad. of Med.
Kiely, Wm. E...420 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Kimmel, H. S.....103 Valley, Dayton..Montgomery Co. Med. Soc.
Kimmell, J. A.....Findlay..Hancock County Med. Soc.
King, Albert.....Cincinnati..Acad. of Med. of Cincinnati.
King, C. P.....Newark..Licking County Med. Soc.
King, Chas. W.....223 N. Main, Dayton..Montgomery Co. Med. Soc.
King, E. Y.....Richwood..Union County Med. Soc.
King, Jno. R.....1268 E. 3rd, Cincinnati..Acad. of Med. of Cincinnati.
King, John I.....Martell..Marion County Med. Soc.
Kinnaman, Chas. L..1474 Cedar, Cleveland..Acad. of Med. of Cleveland.
Kinnicutt, Wm. H...800 Cedar, Cleveland..Acad. of Med. of Cleveland.
Kinsell, D. R.....134 E. State, Columbus..Columbus Acad. of Med.
Kinsman, D. N., Life member, The Normandie, Columbus..Columbus Acad. of Med.
Kious, H. C.....N. High, Columbus..Columbus Acad. of Med.
Kipp, A. E.....Dayton..Montgomery Co. Med. Soc.
Kirkby, C. A.....141 11th, Toledo..Acad. of Med. of Toledo and Lucas County.
Kirkpatrick, A. K.....Eckmansville..Adams County Med. Soc.

Kirkpatrick, O. B.....Cherry Fork..Adams County Med. Soc.
Kistler, Geo. B.....New Comerstown..Tuscarawas Co. Med. Soc.
Kistler, H. B.....Sandusky..Erie County Med. Soc.
Kittsmiller, C. R.....Avondale..Coshocton Co. Med. Soc.
Kittsmiller, F. E.....Piqua..Miami County Med. Soc.
Klaus, Max H.....1659 Lorain, Cleveland..Acad. of Med. of Cleveland
Klauser, F. E.....520 Cherry, Toledo..Acad. of Med. of Toledo and Lucas County.
Kleckner, J. B.....Lynchburg..Highland County Med. Soc.
Klemm, Wm.....Zanesville..Muskingum Co. Med. Soc.
Kline, Chas. F.....Portsmouth..Hempstead Acad. of Med.
Kline, P. J.....Portsmouth..Hempstead Acad. of Med.
Kline, W. L.....143 W. 4th, Dayton..Montgomery Co. Med. Soc
Klippinger, L. G.....Dayton..Montgomery Co. Med. Soc.
Knapp, Chas. C.....Zanesville..Muskingum Co. Med. Soc.
Knight, A. L.....Madisonville..Hamilton County Med. Soc
Knight, Wm...111 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati
Knoop, Ed.....Cincinnati..Acad. of Med. of Cincinnati
Knowlton, W. A..530 Jennings, Cleveland..Acad. of Med. of Cleveland
Kochenderfer, J. H.....Galion..Crawford County Med. Soc.
Koehler, Max.....124 W. 9th, Cincinnati..Acad. of Med. of Cincinnati
Kofron, J. V....1560 Broadway, Cleveland..Acad. of Med. of Cleveland
Konrad, Frances...2120 B'way, Cleveland..Acad. of Med. of Cleveland
Koons, E. S.....Glouster..Athens County Med. Soc.
Kopfstein, F. T..2300 Superior, Cleveland..Acad. of Med. of Cleveland
Korrell, F. A.....Key..Belmont County Med. Soc
Kotershall, J. J..St. John Hosp., Cleveland..Acad. of Med. of Cleveland
Kramer, S. P..21 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati
Krause, B....1465 Wilson ave., Cleveland..Acad. of Med. of Cleveland
Krebs, P. H.....1007 Pearl, Cleveland..Acad. of Med. of Cleveland
Kriedler, A. J...1101 Harrison, Cincinnati..Acad. of Med. of Cincinnati
Krieger, G. L.....Madisonville..Warren County Med. Soc.
Krone, H.....Hamilton..Butler County Med. Soc.
Krouse, L. J..77 Groton Bldg., Cincinnati..Acad. of Med. of Cincinnati
Kuglar, F. E....748 Considine, Cincinnati..Acad. of Med. of Cincinnati.
Kuhn, E. T.....Hopedale..Harrison County Med. Soc
Kunz, John C..511 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Kurtz, C. D.....Tuscarawas..Tuscarawas Co. Med. Soc.
Kurtz, H. B..... Wade Park, Cleveland..Acad. of Med. of Cleveland
Kyle, W. P.....Big Plain..Madison County Med. Soc

Lackey, J. C.....Jamestown..Greene County Med. Soc.
Ladd, Louis W....275 Prospect, Cleveland..Acad. of Med. of Cleveland.
Laffer, W. B.....962 Willson, Cleveland..Acad. of Med. of Cleveland.

Lamb, F. H.....Glendale..Hamilton County Med. Soc.
Lamb, Frederick.....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Lambert, O. A.....Marietta..Washington Co. Med. Soc.
Landes, John H.....815 Race, Cincinnati..Acad. of Med. of Cincinnati.
Landman, Otto.....230 Michigan, Toledo..Acad. of Med. of Toledo and Lucas County.
Landy, Edwin...3015 Colerain, Cincinnati..Acad. of Med. of Cincinnati.
Lane, Albert H.....1845 W. 3rd, Dayton..Montgomery Co. Med. Soc.
Lane, F. W.....Cambridge..Guernsey County Med. Soc.
Langdon, F. W..5 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Langel, R. P.....Neptune..Mercer County Med. Soc.
Large, S. H.....Cleveland..Acad. of Med. of Cleveland.
Larimore, F. C., Life member..Mt. Vernon..Knox County Med. Soc.
Larkin, John C.....Hillsboro..Highland County Med. Soc.
LaSalle, Jas. J.....228 Michigan, Toledo..Acad. of Med. of Toledo and Lucas County.
Lathrop, A. B.....Swanton..Fulton County Med. Soc.
Latimer, Jas. P.....Newark..Licking County Med. Soc.
Lauder, Ed.....275 Prospect, Cleveland..Acad. of Med. of Cleveland.
Lauder, Robt. J., 1419 Woodland, Cleveland..Acad. of Med. of Cleveland.
Laudick, J. F.....Lima..Allen County Med. Soc.
Laugholtz, J. L.....Oak Harbor..Ottawa County Med. Soc.
Lawless, J. J., Jr.....Detroit, Toledo..Acad. of Med. of Toledo and Lucas County.
Lawless, J. J., Sr...1205 Broadway, Toledo..Acad. of Med. of Toledo and Lucas County.
Lawrence, A. E.....Coolville..Athens County Med. Soc.
Lawrence, F. F....328 E. State, Columbus..Columbus Acad. of Med.
Leach, Robt.....Mt. Sterling..Madison County Med. Soc.
Leach, Sherman.....Columbus..Columbus Acad. of Med.
Learned, A. J.....Millfield..Athens County Med. Soc.
Leberman, E. O.....Akron..Summit County Med. Soc.
Lechner, S. B.....Dell Roy..Carroll County Med Soc.
LeCrone, T. W.....Millersport..Fairfield County Med. Soc.
Lee, H. J.....73 Tilden ave., Cleveland..Acad. of Med. of Cleveland.
Lee, H. T.....Athens..Athens County Med. Soc.
Lee, J. L.....Akron..Summit County Med. Soc.
Lee, James F.....Mt. Vernon..Knox County Med. Soc.
Leever, W. E.....Owensville..Clermont County Med. Soc.
LeFever, E. W.....Marietta..Washington Co. Med. Soc.
Lehman, B. H.....Home City..Hamilton County Med. Soc.
Leist, G. G.....Royalton..Fairfield County Med. Soc.
Leister, R. B.....Tiffin..Seneca County Med. Soc.
Leland, L. G.....Newton Falls..Trumbull County Med. Soc.
Lemon, L. A.....Wellsville..Columbiana Co. Med. Soc.

Lenhart, C. M.....Zanesville..Muskingum Co. Med. Soc.
Lenhart, Peter J.....Wauseon..Fulton County Med. Soc.
Lenker, John N..Osborn Bldg., Cleveland..Acad. of Med. of Cleveland.
Leonard, Benjamin S., Life member,
West Liberty..Logan County Med. Soc.
Leonard, W. W.....Akron..Summit County Med. Soc.
Lerch, A. V.....Pleasantville..Perry County Med. Soc.
Leroy, B. R.....Chagrin Falls..Acad. of Med. of Cleveland.
Levenberg, B. .....Cleveland..Acad. of Med. of Cleveland.
Levis, D. H.....Akron..Summit County Med. Soc.
Lewis, H. A.....Continental..Putnam County Med. Soc.
Lewis, J. M.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Lewis, Robt. C. M.....Marion..Marion County Med. Soc.
Lewis, W. F.....Martinsburg..Knox County Med. Soc.
Lewis, W. G.....Mt. Sterling..Madison County Med. Soc
Lewis, Wm. C., Life member.....Rushville..Fairfield County Med. Soc.
Lewis, Wm. E.....409 E. 5th, Cincinnati..Acad. of Med. of Cincinnati.
Lichliter, D. C.....809 E. 5th, Dayton..Montgomery Co. Med. Soc.
Lichty, M. J..Genesee & Hough, Cleveland..Acad. of Med. of Cleveland.
Lieuellen, J. O.....Mainesville..Warren County Med. Soc.
Light, A. L.....21 S. Wilkinson, Dayton..Montgomery Co. Med. Soc.
Light, Frank.....Ottawa..Putnam County Med. Soc.
Linawearer, A. H.....Findlay..Hancock County Med. Soc.
Lincoln, W. R.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Lincoln, Wm. R....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Lindsay, F. T.....Xenia..Greene County Med. Soc.
Lindsay, John A.....Salineville..Columbiana Co. Med. Soc.
Lindsay, Samuel C..3425 Euclid, Cleveland..Acad. of Med. of Cleveland.
Linhart, C. P..The Vendome, Columbus..Columbus Acad. of Med.
Link, Jos. A.....High, Springfield..Clark County Med. Soc.
Linn, Fred. W.....1111 Lorain, Cleveland..Acad. of Med. of Cleveland.
Linton, E. L.....Walnut Run..Madison County Med. Soc.
Little, J. W.....Cynthiana..Pike County Med. Soc.
Littleton, Robt. Y.....Stout..Adams County Med. Soc.
Locke, Lucien G.....Haverhill..Scioto County Med. Soc.
Lockhart, John M.....Eckmansville..Adams County Med. Soc.
Lone, M. T.....Shelby..Richland County Med. Soc.
Loney, Wm. B.....West Union..Adams County Med. Soc.
Long, James.....Bryan..Williams County Med. Soc
Long, J. W.....Bryan..Williams County Med. Soc.
Longbrake, P. D.....Marysville..Union County Med. Soc.
Longfellow, J. W.....Urbana..Champaign Co. Med. Soc.
Longfellow, R. C.....1611 22nd, Toledo..Acad. of Med. of Toledo and Lucas County.

Lorimer, H. F.....Jamestown..Greene County Med. Soc.
Lott, F. L.....Columbiana..Columbiana Co. Med. Soc.
Loughridge, Wm. E.....Mansfield..Richland County Med. Soc.
Louthan, E. C.....Clarkson..Columbiana Co. Med. Soc.
Louy, Chas....Cherry & Superior, Toledo..Acad. of Med. of Toledo and Lucas County.
Love, George.....Michigan, Toledo..Acad. of Med. of Toledo and Lucas County.
Love, M. J.....Bloomingville..Erie County Med. Soc.
Love, Wesley.....Higginsport..Brown County Med. Soc.
Loveless, C. J.....Perryton..Licking County Med. Soc.
Loving, Starling, Life member...Columbus..Columbus Acad. of Med.
Lowe, J. H.....Piqua..Miami County Med. Soc.
Lowe, J. W.....Mentor..Lake County Med. Soc.
Lower, J. D.....Bakersville..Coshocton Co. Med. Soc.
Lower, Wm. E...Osborn Bldg., Cleveland..Acad. of Med. of Cleveland.
Lowey, A. Clark .....Ironton..Lawrence County Med. Soc.
Lowman, John H..441 Prospect, Cleveland..Acad. of Med. of Cleveland.
Lowry, J. W.....Ironton..Lawrence County Med. Soc.
Loyer, Albert E.....New Washington..Crawford County Med. Soc.
Lucas, N. C.....1158 Pearl, Cleveland..Acad. of Med. of Cleveland.
Lucas, W. H.....853 Lorain, Cleveland..Acad. of Med. of Cleveland.
Luck, H. C....870 Hough ave., Cleveland..Acad. of Med. of Cleveland.
Ludlow, E. W.....Urbana..Champaign Co. Med. Soc.
Luison, L. A.....Co. Hospital, Toledo..Acad. of Med. of Toledo and Lucas County.
Luke, Z. V.....Basil..Fairfield County Med. Soc.
Lukens, Chas.....912 Jefferson, Toledo..Acad. of Med. of Toledo and Lucas County.
Lupton, Ella G.....Gallipolis..Gallia County Med. Soc.
Lyle, Benj. F.....2302 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Lyle, W. R.....Scio..Harrison County Med. Soc.
Lyman, C. W., Life member...Wadsworth..Medina County Med. Soc.
Lyne, Geo. L.....New Paris..Preble County Med. Soc.
Lyons, M. J.....Cadiz..Hamilton County Med. Soc.

MacMillan, W..Auburn-Sanders, Cincin'ti..Acad. of Med. of Cincinnati.
McAllister, A. L.....Beaver..Pike County Med. Soc.
McBride, D. N.....Hillsboro..Highland County Med. Soc.
McBride, J. L.....Mansfield..Richland County Med. Soc.
McBride, John D.....Hillsboro..Highland County Med. Soc.
McBurney, Ed.....Jackson Center..Shelby County Med. Soc.
McCafferty, F.....43 E. Main, Columbus..Columbus Acad. of Med.
McCall, E. O.....Portsmouth..Hempstead Acad. of Med.

McCallum, D. D.....Crestline..Crawford County Med. Soc.
McCane, F. K.....City Hospital, Cleveland..Acad. of Med. of Cleveland.
McCann, Thos. H.....Scioto..Scioto County Med. Soc.
McCartney, John .....Girard..Trumbull County Med. Soc.
McCarty, E. F.1605 Madison rd., Cincinnati..Acad. of Med. of Cincinnati.
McCarty, T. F.....Constantia..Delaware County Med. Soc.
McCassy, Jno. H....54 Wilkinson, Dayton..Montgomery Co. Med. Soc.
McCay, C. D.....Kenton..Hardin County Med. Soc.
McClain, Jesse .....Coshocton..Coshocton Co. Med. Soc.
McCleister, J. C.....Harrisville..Harrison County Med. Soc.
McClellan, Benj. R.....Xenia..Greene County Med. Soc.
McClellan, H. R.....Xenia..Greene County Med. Soc.
McClellan, Jas. S.....Bellaire..Belmont County Med. Soc.
McClung, J. C.....Leipsic..Putnam County Med. Soc.
McClure, Jas. A.....29 W. 5th, Columbus..Columbus Acad. of Med.
McClure, Jas. M.....Marietta..Washington Co. Med. Soc.
McClure, John B.....Marietta..Washington Co. Med. Soc.
McCollam, Jas. A.....Uhrichsville..Tuscarawas Co. Med. Soc.
McCollum, E. J., Life member .....Tiffin..Seneca County Med. Soc.
McCommon, W. A.....E. Palestine..Columbiana Co. Med. Soc.
McCormick, Geo. D.....Wamsley..Adams County Med. Soc.
McCormick, J. C.....Mt. Gilead..Morrow County Med. Soc.
McCoy, C. W.....South Point..Lawrence County Med. Soc.
McCoy, Joseph J.....Steubenville..Jefferson County Med. Soc.
McCray, Orville .....Miamisburg..Montgomery Co. Med. Soc.
McCready, Jas. .....Monroe..Butler County Med. Soc.
McCready, S. R.....Lisbon..Columbiana Co. Med. Soc.
McCullough, A. H.....Mansfield..Richland County Med. Soc.
McCullough, G. E.....Troy..Miami County Med. Soc.
McCune, C. O.....Unionville Center..Union County Med. Soc.
McCurdy, H. M.....Coshocton..Coshocton Co. Med. Soc.
McCurdy, John, Life member..Youngstown..Mahoning County Med. Soc.
McCurdy, L. C.....Coshocton..Coshocton Co. Med. Soc.
McDiarmid, N. S.....Dayton..Montgomery Co. Med. Soc.
McDonald, D. M.....Akron..Summit County Med. Soc.
McDougal, Chas. S.....Athens..Athens County Med. Soc.
McDougal, Jno. G.....New Lexington..Perry County Med. Soc.
McGavran, Chas. W.142 E.Long, Columbus..Columbus Acad. of Med.
McGavran, S. B. .....Cadiz..Harrison County Med. Soc.
McGee, John B..1405 Woodland, Cleveland..Acad. of Med. of Cleveland.
McGee, W. C.....Vanlue..Hancock County Med. Soc.
McGougle, M. B.....Ashley..Delaware County Med. Soc.
McGregor, Alex. ..King Bldg., Springfield..Clark County Med. Soc.
McGregor, Chas.....203 W. 3rd, Dayton..Montgomery Co. Med. Soc.

McGrew, J. A.....New Athens..Harrison County Med. Soc.
McGuffin, George .....Pettisville..Fulton County Med. Soc.
McGuire, S. B.....Canal Dover..Tuscarawas Co. Med. Soc.
McHenry, O. E.....Blue Creek..Adams County Med. Soc.
McIntire, H. L.....Columbiana..Columbiana Co. Med. Soc.
McKee, Ed. S.....10 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
McKendree, Lydia .....Bowling Green..Wood County Med. Soc.
McKendree, M. A.....Bowling Green..Wood County Med. Soc.
McKenzie, F. B.....Oakland..Clinton County Med. Soc.
McKerrihan, S. B.....Portsmouth..Hempstead Acad. of Med.
McKim, F. E.....Marietta..Washington Co. Med. Soc.
McKitrick, L. .....Dublin..Franklin County Med. Soc.
McLachlan, N. L.....Findlay..Hancock County Med. Soc.
McLaughlin, C. M.....Westville..Champaign Co. Med. Soc.
McLaughlin, C. C.....Dunkirk..Hardin County Med. Soc.
McLean, Clyde C.....1109 W. 3rd, Dayton..Montgomery Co. Med. Soc.
McMasters, I. N.....Demos..Belmont County Med. Soc.
McMechan, J. C.....639 W. 7th, Cincinnati..Acad. of Med of Cincinnati.
McMichael, J. C.....Glenville..Acad. of Med. of Cleveland.
McMurray, James .....Hubbard..Trumbull County Med. Soc.
McNamara, A. J.....176 Euclid, Cleveland..Acad. of Med. of Cleveland.
McNeil, R. C.....Belle Center..Logan County Med. Soc.
McPeck, E. E.....855 Hough, Cleveland..Acad. of Med. of Cleveland.
McQueen, D. W.....Camden..Preble County Med. Soc.
McTeague, N. T.....New Lexington..Perry County Med. Soc.
McVay, F. P.....Athens..Athens County Med. Soc.
McVety, A. F.....1514 Madison, Toledo..Montgomery Co. Med. Soc.
Mabley, H. C..2088 Euclid ave., Cleveland..Acad. of Med. of Cleveland.
Mackenzie, Jno. C..20 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Macleod, J. J. R.....Cleveland..Acad. of Med. of Cleveland.
Macready, J. H.....Delhi, Cincinnati..Acad. of Med. of Cincinnati
Madden, P. R.....Xenia..Greene County Med. Soc.
Maddox, R. C..2729 Woodburn, Cininnati..Acad. of Med. of Cincinnati.
Maerker, A. E. H.....Napoleon..Henry County Med. Soc.
Magruder, J. J..111 Cleveland, Columbus..Columbus Acad. of Med.
Makemson, F. R.....Degraff..Logan County Med. Soc.
Mallory, H.....Hamilton..Butler County Med. Soc.
Mallow, E. H.....625 N. Main, Dayton..Montgomery Co. Med. Soc.
Maloney, J. J.....427 Clark, Cincinnati..Acad. of Med. of Cincinnati.
Malsbary, G. E..1604 Sycamore, Cincinnati..Acad. of Med. of Cincinnati
Marcus, Jos.....411 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Marcus, Jule.....411 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Mardis, A. W.....Lebanon..Warren County Med. Soc.
Marquand, E. V.....Conesville..Coshocton Co. Med. Soc.

Marquart, A. C.....Crestline..Crawford County Med. Soc.
Marquart, O. M.....Osborne..Greene County Med. Soc.
Marquis, Thos. B.....Lisbon..Columbiana Co. Med. Soc.
Marsh, M. I.....Cedarville..Greene County Med. Soc.
Marsh, V. N.....Flushing..Belmont County Med. Soc.
Marshall, D. M.....208 Main, Toledo..Acad. of Med. of Toledo and Lucas County.
Marshall, F. M.....Coshocton..Coshocton Co. Med. Soc.
Marshall, George.....Dellroy..Carroll County Med. Soc.
Marshall, R. J.....E. Liverpool..Columbiana Co. Med. Soc.
Marshall, Thos.....622 N. Main, Dayton..Montgomery Co. Med. Soc.
Marshall, W. C..14 N. Broadway, Dayton..Montgomery Co. Med. Soc.
Martin, A. B.....Bentonville..Adams County Med. Soc.
Martin, F. S.....Napoleon..Henry County Med. Soc.
Martin, Geo. E.....Anna..Shelby County Med. Soc.
Martin, H. W.....West Manchester..Preble County Med. Soc.
Martin, J. J.....Bucyrus..Crawford County Med. Soc.
Martin, Jno. T.....Marion..Marion County Med. Soc.
Martin, John V.....526 Front, Toledo..Acad. of Med. of Toledo and Lucas County.
Martin, Thos. C...275 Prospect, Cleveland..Acad. of Med. of Cleveland.
Marting, W. F.....Ironton..Lawrence County Med. Soc.
Martz, J. G.....Greenville..Darke County Med. Soc.
Marvin, A. H.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Marxmiller, H. G....19 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Maschke, A. F..1200 Case ave., Cleveland..Acad. of Med. of Cleveland.
Mason, T. R.....Sugargrove..Fairfield County Med. Soc.
Mather, E. L.....Akron..Summit County Med. Soc.
Mathews, J. F.....Lima..Allen County Med. Soc.
Matthews, Jno. W.....Buford..Highland County Med. Soc.
Mauser, A. H.....Latty..Paulding County Med. Soc.
May, Eugene .....359 E. 3rd, Cincinnati..Acad. of Med. of Cincinnati.
May, Morris .....359 E. 3rd, Cincinnati..Acad. of Med. of Cincinnati.
Mayhugh, Geo. H.....Westerville..Franklin County Med. Soc.
Mayers, C. F.....Tiffin..Seneca County Med. Soc.
Maynard, O. T.....Elyria..Lorain County Med. Soc.
Meade, A. H.....25 Brainard, Cleveland..Acad. of Med. of Cleveland.
Meade, E. B.....Sedalia..Madison County Med. Soc.
Means, Chas. S.....715 N. High, Columbus..Columbus Acad. of Med.
Means, W. J.....715 N. High, Columbus..Columbus Acad. of Med.
Meek, A. W.....Greenville..Darke County Med. Soc.
Meek, J. H.....Glencoe..Belmont County Med. Soc.
Meeker, L. C.....Holgate..Henry County Med. Soc.
Meitus, Jos.....512 Everett, Cincinnati..Acad. of Med. of Toledo and Lucas County.

Melchers, E.....1004 Jefferson, Toledo..Acad. of Med. of Toledo and Lucas County.
Melick, W. A.....Zanesville..Muskingum Co. Med. Soc.
Mercer, J. A.....Rainsboro..Highland County Med. Soc.
Meredith, W. G.....2338 Euclid, Cleveland..Acad. of Med. of Cleveland.
Merriam, W. H..Osborne Bldg., Cleveland..Acad. of Med. of Cleveland.
Merriman, D. J.....Painesville..Lake County Med. Soc.
Merwin, J. T.....Athens..Athens County Med. Soc.
Merz, Chas. H.....Sandusky..Erie County Med. Soc.
Messenger, A. C.....Xenia..Greene County Med. Soc.
Metcalf, B. F.....Greenville..Darke County Med. Soc.
Metz, J. A.....E. Liverpool..Columbiana Co. Med. Soc.
Metzenbaum, M.....1117 Case, Cleveland..Acad. of Med. of Cleveland.
Metzler, W. M.....Vanlue..Hancock County Med. Soc.
Michael, F. M.....Eaton..Preble County Med. Soc.
Micklethwait, W. D.....Portsmouth..Hempstead Acad. of Med.
Middleton, W. D.....Cuyahoga Falls..Summit County Med. Soc.
Miles, F. T.....Salem..Columbiana Co. Med. Soc.
Miles, May S..McMillan & Milk, Cincinnati..Acad. of Med. of Cincinnati.
Miller, A. C.....Covington..Miami County Med. Soc.
Miller, A. F. .....Shanesville..Tuscarawas Co. Med. Soc.
Miller, A. H.....997 Pearl st., Cleveland..Acad. of Med. of Cleveland.
Miller, D. E.....1209 N. Main, Dayton..Montgomery Co. Med. Soc.
Miller, E. .....Enon..Clark County Med. Soc.
Miller, I. C.....2544 Auburn, Cincinnati..Acad. of Med. of Cincinnati.
Miller, J. H.....Delaware..Delaware County Med. Soc.
Miller, James .....Congo..Perry County Med. Soc.
Miller, James E.....Steubenville..Jefferson County Med. Soc.
Miller, Jas. W.....29 E. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Miller, Jay H.....Wauseon..Fulton County Med. Soc.
Miller, Jno. D.....4 Johns, Cincinnati..Acad. of Med. of Cincinnati.
Miller, N. C.....Fostoria..Seneca County Med. Soc.
Miller, R. W.....634 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Miller, R. W.....Hemlock..Perry County Med. Soc.
Miller, S. A. D.....Lancaster..Fairfield County Med. Soc.
Miller, S. E.....Florida..Henry County Med. Soc.
Miller, Wm. .....Thurman..Gallia County Med. Soc.
Millikin, Benj. L....260 Euclid, Cleveland..Acad. of Med. of Cleveland.
Milliken, C. W.....Akron..Summit County Med. Soc.
Milliken, Emma .....Ontario..Richland County Med. Soc.
Millikin, M. .....Hamilton..Butler County Med. Soc.
Millikin, Dan .....Hamilton..Butler County Med. Soc.
Mills, C. D.....Marysville..Butler County Med. Soc.
Mills, D. C.....New Lebanon..Montgomery Co. Med. Soc.

Mills, J. F.....Gnadenhutten..Tuscarawas Co. Med. Soc.
Minich, Geo. E.....W. Farmington..Trumbull County Med. Soc.
Minor, Chas. L....9½ E. Main, Springfield..Clark County Med. Soc.
Minor, H. C.....Toronto..Jefferson County Med. Soc.
Minton, F. P.....Pane & Bakewell, Toledo..Acad. of Med. of Toledo and Lucas County.
Mitchell, A. W.....Georgetown..Brown County Med. Soc.
Mitchell, E. W.3503 Reading rd.,Cincinnati..Acad. of Med. of Cincinnati.
Mitchell, F. M.....Cambridge..Guernsey County Med. Soc.
Mitchell, T. A.....Owensville..Clermont County Med. Soc.
Mithofer, Wm...321 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Mizer, Thos. J.....797 Lorain, Cleveland..Acad. of Med. of Cleveland.
Moffatt, Jno. W.....Glencoe..Belmont County Med. Soc.
Molony, L. A.....731 W. 5th, Cincinnati..Acad. of Med. of Cincinnati.
Monfort, Chas. E.....Fairhaven..Preble County Med. Soc.
Monger, J. E.....Greenville..Darke County Med. Soc.
Monhank, R. W.....Royalton..Fairfield County Med. Soc.
Monosmith, C. B.....Lorain..Lorain County Med. Soc.
Montenyohl, E. A.....Akron..Summit County Med. Soc.
Moody, I. A.....Junction City..Perry County Med. Soc.
Mooney, C. M.....Waverly..Pike County Med. Soc.
Moore, A. R.....Portsmouth..Hempstead Acad. of Med.
Moore, Clark A.....Cambridge..Guernsey County Med. Soc.
Moore, D. L.....141 E. State, Columbus..Columbus Acad. of Med.
Moore, E. B.....Moorefield..Harrison County Med. Soc.
Moore, F. O.....Lisbon..Columbiana Co. Med. Soc.
Moore, H. M.....Oxford..Butler County Med. Soc.
Moore, J. M.....1960 St. Clair, Cleveland..Acad. of Med. of Cleveland.
Moore, John J.....So. Charleston..Clark County Med. Soc.
Moore, T. K.....Akron..Summit County Med. Soc.
Moore, T. M.....Willoughby..Lake County Med. Soc.
Moore, V. O.....1193 Starr, Toledo..Acad. of Med. of Toledo and Lucas County.
Moore, Wm. .....Lisbon..Columbiana Co. Med. Soc.
Moore, W. R.....Swan..Hocking County Med. Soc.
Moore, Wm. R.....Swan..Hocking County Med. Soc.
Moorehouse, Geo. W..842 Logan, Cleveland..Acad. of Med. of Cleveland.
Morehouse, G. W.....Sparta..Morrow County Med. Soc.
Morgan, C. D.....Galion..Crawford County Med. Soc.
Morganstern, A.....124 W. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Morgenroth, S. .....Bellefontaine..Logan County Med. Soc.
Morris, Earl .....Zimmerman..Greene County Med. Soc.
Morris, W. E.....Lisbon..Columbiana Co. Med. Soc.
Morrison, E. B.....Gallipolis..Gallia County Med. Soc.
Morton, F. J.....962 Lorain, Cleveland..Acad. of Med. of Cleveland.

Mory, John J., Life member.....St. Marys..Auglaize County Med. Soc.
Moses, J. B.....Crestline..Crawford County Med. Soc.
Mosgrove, J. R.....Steubenville..Jefferson County Med. Soc.
Mosgrove, S. M.....Urbana..Champaign Co. Med. Soc.
Moss, Ed. H.....504 E. Liberty, Cincinnati..Acad. of Med. of Cincinnati.
Mounts, L., Life member.....Morrow..Warren County Med. Soc.
Moury, D. .....Bellefontaine..Logan County Med. Soc.
Moxley, N. K.....Ironton..Lawrence County Med. Soc.
Mueller, O.....509 Pearl st., Cleveland..Acad. of Med. of Cleveland.
Muhlbery, Wm....5 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Mulford, Jas. .....Lebanon..Warren County Med. Soc.
Mulholland, Wm. .....Sidney..Shelby County Med. Soc.
Mumaw, W. S.....Kansas..Seneca County Med. Soc.
Mundhenk, A. O.....W. Alexandria..Preble County Med. Soc.
Mundhenk, H. C.....Brookville..Montgomery Co. Med. Soc.
Mundhenk, L. R.....W. Alexandria..Preble County Med. Soc.
Mundhenk, W. S.....Brookville..Montgomery Co. Med. Soc.
Murbach, E. A.....Archbold..Fulton County Med. Soc.
Murphey, D. M.....Bethesda..Belmont County Med. Soc.
Murphy, A. D.....124 Garfield, Cincinnati..Acad. of Med. of Cincinnati.
Murphy, J. W.....Eagle Mills..Vinton County Med. Soc.
Murphy, John J.....Lima..Allen County Med. Soc.
Murphy, John W....51 Groton, Cincinnati..Acad. of Med. of Cincinnati.
Murphy, W. E.....628 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Murphy, Wm. D.....Fayette..Fulton County Med. Soc.
Murray, F. M.....Delaware..Delaware County Med. Soc.
Murray, J. E.....Piqua..Miami County Med. Soc.
Murray, L. S., Life member.....Medina..Medina County Med. Soc.
Myers, C. H.....1556 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Myers, G. C.....343 S. Main, Dayton..Montgomery Co. Med. Soc.
Myers, Jno. E.....53 E. High, Springfield..Clark County Med. Soc.
Myers, Noah .....53 E. High, Springfield..Clark County Med. Soc.
Myers, Park L.....1921 Franklin, Toledo..Acad. of Med. of Toledo and Lucas County.

Nachtigall, B. J. A...820 Lorain, Cleveland..Acad. of Med. of Cleveland.
Nash, A. C.....2880 St. Clair, Cleveland..Acad. of Med. of Cleveland.
Neffner, R. T.....Bell..Highland County Med. Soc.
Neibling, Wm. C.....Findlay..Hancock County Med. Soc.
Nelles, H. W. H..359 E. Broadway, Toledo..Acad. of Med. of Toledo and Lucas County.
Nelson, A. .....Cincinnati..Acad. of Med. of Cincinnati.
Nelson, Chas. F.....Cleveland..Acad. of Med. of Cleveland.
Nelson, H. W.....Steubenville..Jefferson County Med. Soc.

Nelson, L.....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Nessley, Geo. B.....Grove City..Franklin County Med. Soc.
Nevin, W. C.....Lisbon..Columbiana Co. Med. Soc.
Newcomb, J. I.....West Unity..Williams County Med. Soc.
Nickles, Sam'l ....1406 John st., Cincinnati..Acad. of Med. of Cincinnati.
Nincehelser, O. A.....Mechanicsburg..Champaign Co. Med. Soc.
Nippert, E.....1624 Charles, Cincinnati..Acad. of Med. of Cincinnati.
Noble, A.....Wellsville..Columbiana Co. Med. Soc.
Noble, Arthur .....Winchester..Adams County Med. Soc.
Noble, H. E.....808 E. Broadway, Toledo..Acad. of Med. of Toledo and Lucas County.
Noland, S. A.....W. Jefferson..Madison County Med. Soc.
Norman, L. M.....Millerstown..Champaign Co. Med. Soc.
Norrick, J. H.....Fredericktown..Knox County Med. Soc.
Norris, C. E.....Akron..Summit County Med. Soc.
Norris, J. H..... Fostoria..Seneca County Med. Soc.
Norris, King A,...716 Neil ave., Columbus..Columbus Acad. of Med.
Norris, O. L.....Deshler..Henry County Med. Soc.
North, John.....517 Madison, Toledo..Acad. of Med. of Toledo and Lucas County.
North, T. L.....Greenville..Darke County Med. Soc.
Norton, F. B.....150 Kennard, Cleveland..Acad. of Med. of Cleveland.
Nuding, W. H..... Napoleon..Henry County Med. Soc.
Nungesser, John J....97 Lyman, Cleveland..Acad. of Med. of Cleveland.

Oakley, F. G.....855 Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
O'Brien, D. ..... Urbana..Champaign Co. Med. Soc.
Obrist, J. W.....Beaver..Pike County Med. Soc.
O'Ckuly, J. F.....Ottoville..Putnam County Med. Soc.
O'Connell, R. .....Portsmouth..Hempstead Acad. of Med.
O'Dell, Sam'l .....Swanton..Fulton County Med. Soc.
Odenbaugh, J. .....Sandusky..Erie County Med. Soc.
Offenbacher, C. A.....St. Paris..Champaign Co. Med. Soc.
O'Ferrall, R. M.....Piqua..Miami County Med. Soc.
Ogan, F. W.....Jamestown..Greene County Med. Soc.
Ogden, C. B.....E. Liverpool..Columbiana Co. Med. Soc.
Ohlmacher, A. P.....Gallipolis..Gallia County Med. Soc.
Oliver, James A.....Steubenville..Jefferson County Med. Soc.
Oliver, John C.....628 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Oman, E. S.....101 Starr, Columbus..Columbus Acad. of Med.
O'Neill, O. U.....Ironton..Lawrence County Med. Soc.
Ong, A. R.....Martins Ferry..Belmont County Med. Soc.
Ormsby, H. B.,Central & Brownell,Cleveland..Acad. of Med. of Cleveland.
Orr, George B.....428 E. 4th, Cincinnati..Acad. of Med. of Cincinnati.

Osborn, Geo. W.....Dry Run..Scioto County Med. Soc.
Osborn, Wm. O...Osborn Bldg., Cleveland..Acad. of Med. of Cleveland.
Osburn, C. W..... Samantha..Highland County Med. Soc.
Oster, Louis W...1261 St. Clair, Cleveland..Acad. of Med. of Cleveland.
Oswald, Benj. F....2010 Detroit, Cleveland..Acad. of Med. of Cleveland.
Overholt, E. L..... Fostoria..Seneca County Med. Soc.

Page, H. M.....Warren..Trumbull County Med. Soc.
Palmer, B.....245 E. Long, Columbus..Columbus Acad. of Med.
Palmer, C. D., Life member,
3539 Reading rd., Cincinnati..Acad. of Med. of Cincinnati.
Pancake, A. .....Springfield..Clark County Med. Soc.
Parent, W. H.....Lima..Allen County Med. Soc.
Parke, M. J.....331 Prospect, Cleveland..Acad. of Med. of Cleveland.
Parker, C. B.....Gallipolis..Gallia County Med. Soc.
Parker, Chas. B.....425 Euclid, Cleveland..Acad. of Med. of Cleveland.
Parker, Chas. G.....Gallipolis..Gallia County Med. Soc.
Parker, H. M.....Delta..Fulton County Med. Soc.
Patterson, A. V., Life member...Mansfield..Richland County Med. Soc.
Patterson, C. E.....Morning Sun..Preble County Med. Soc.
Patterson, C. L....26 S. Wilkinson, Dayton..Montgomery Co. Med. Soc.
Patterson, Chas. U.....Uhrichsville..Tuscarawas Co. Med. Soc.
Patterson, S. J.....Elkton..Columbiana Co. Med. Soc.
Patton, M. V.....50 High, Springfield..Clark County Med. Soc.
Patton, Wm. B..New Zimmerman Bldg.,
Springfield..Clark County Med. Soc.
Paul, A. L.....Ottawa..Putnam County Med. Soc.
Paul, Chas. M...34 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Paulin, N. O.....962 Willson, Cleveland..Acad. of Med. of Cleveland.
Pav, Anton F.....1574 Willson, Cleveland..Acad. of Med. of Cleveland.
Pearce, Chas. T.....77 Groton, Cincinnati..Acad. of Med. of Cincinnati.
Pearce, Enoch, Life member...Steubenville..Jefferson County Med. Soc.
Pearce, H. M. .....Urbana..Champaign Co. Med. Soc.
Pearson, H. R.....West Milton..Miami County Med. Soc.
Pease, R. C.....Chardon..Geauga County Med. Soc.
Peelle, F. L..... Wilmington..Clinton County Med. Soc.
Peligo, S. E. G.....Marshfield..Athens County Med. Soc.
Pennell, W. W.....Fredericktown..Knox County Med. Soc.
Pennywitt, R. C.....137 W. 5th, Dayton..Montgomery Co. Med. Soc.
Pepper, L. C..... Loramie..Shelby County Med. Soc.
Perfect, Marie..... Delaware..Delaware County Med. Soc.
Perkins, R. G.....1527 Euclid, Cleveland..Acad. of Med. of Cleveland.
Persinger, C. A...1076 E. Main, Columbus..Columbus Acad. of Med.
Peskind, A.....1354 Willson, Cleveland..Acad. of Med. of Cleveland.

Peskind, Sam'l.....1854 Willson, Cleveland..Acad. of Med. of Cleveland.
Peterson, H. D.....Kelley's Island..Erie County Med. Soc.
Petrie, M. P.....719 Giddings, Cleveland..Acad. of Med. of Cleveland.
Phelps, A. V.....510 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Pherson, A. M.....Osborn..Greene County Med. Soc.
Philips, D. P.....Kenton..Hardin County Med. Soc.
Philips, D. S.....Morristown..Belmont County Med Soc.
Phillips, J. McI..Grant & Long, Columbus..Columbus Acad. of Med.
Phillips, J. T.....Oregonia..Warren County Med. Soc.
Phillips, M. .....Fremont..Sandusky County Med. Soc.
Phillips, W. O.....Centerburg..Knox County Med. Soc.
Phillips, W. S.....Belle Center..Logan County Med. Soc.
Philo, D. W.....Woodville..Sandusky County Med. Soc.
Phinney, F. D.....Cincinnati..Acad. of Med. of Cincinnati.
Pickering, G. W.....Urbana..Champaign Co. Med. Soc.
Pickering, W. C.....Columbus..Columbus Acad. of Med.
Pierce, R. L.....Mt. Gilead..Morrow County Med. Soc.
Pierret, Geo. A.....Cincinnati..Acad. of Med. of Cincinnati.
Piersol, Jos. .....Bellaire..Belmont County Med. Soc.
Piper, J. W.....Bethesda..Belmont County Med. Soc.
Piper, Wm. O. S.....Bellaire..Belmont County Med. Soc.
Pitkin, Carlos .....Glenville..Acad. of Med. of Cleveland.
Pitzele, W. A.....Lorain..Lorain County Med. Soc.
Pixley, M. S.....Portsmouth..Hempstead Acad. of Med.
Placak, Jos. C....City Hospital, Cleveland..Acad. of Med. of Cleveland.
Platter, H. M....102 N. Fourth, Columbus..Columbus Acad. of Med.
Plattfaut, Wm. W..Reibold Bldg., Dayton..Montgomery Co. Med. Soc.
Plum, H. R.....Lancaster..Fairfield County Med. Soc.
Podesta, J. S.....2113 Vine st., Cincinnati..Acad. of Med. of Cincinnati.
Podlewski, S. J.....Steubenville..Jefferson County Med. Soc.
Pollock, Robt...558 Hough ave., Cleveland..Acad. of Med. of Cleveland.
Pomeroy, F. S.....Chardon..Geauga County Med. Soc.
Pontius, C. R.....Fremont..Sandusky County Med. Soc.
Pool, Frank A.....Bellefontaine..Logan County Med. Soc.
Pool, H. J.....Port Clinton..Ottawa County Med. Soc.
Poole, A. C....2913 Woodburn, Cincinnati..Acad. of Med. of Cincinnati.
Pope, C.....260 Euclid, Cleveland..Acad. of Med. of Cleveland.
Pope, J. E.....Bowling Green..Wood County Med. Soc.
Porter, E. H.....Tiffin..Seneca County Med. Soc.
Porter, M.....615 McLain, Dayton..Montgomery Co. Med. Soc.
Porter, Wm. D....2531 Gilbert, Cincinnati..Acad. of Med. of Cincinnati.
Pounds, J. A.....Ostrander..Delaware County Med. Soc.
Povey, Wm. G..693 Hough ave., Cleveland..Acad. of Med. of Cleveland.
Powell, H. H.....467 Prospect, Cleveland..Acad. of Med. of Cleveland.

Powell, Wm. S.....Defiance..Defiance County Med. Soc.
Prather, Wm. F.....528 S. Wayne, Dayton..Montgomery Co. Med. Soc.
Pratt, L. C.....Bellefontaine..Logan County Med. Soc.
Pressy, A. J.....900 Fairmount, Cleveland..Acad. of Med. of Cleveland.
Preston, H. S.....Mutual..Champaign Co. Med. Soc.
Price, H. H.....Akron..Summit County Med. Soc.
Pricer, W. E.....Ironton..Lawrence County Med. Soc.
Prichard, A. L.....Nelsonville..Athens County Med. Soc.
Primrose, I. P.....Nelsonville..Athens County Med. Soc.
Prince, J. W.....Piqua..Miami County Med. Soc.
Prince, W. N.....120 Clifton, Springfield..Clark County Med. Soc.
Prine, Robert .....Ripley..Brown County Med. Soc.
Pritchard, W. H,. State Hospital, Columbus..Columbus Acad. of Med.
Probst, Chas. O....180 E. State, Columbus..Columbus Acad. of Med.
Propper, I. J.....368 Woodland, Cleveland..Acad. of Med. of Cleveland.
Protzman, E. S..... Kenton..Hardin County Med. Soc.
Prugh, Geo. W....2101 Eastern, Cincinnati..Acad. of Med. of Cincinnati.
Pucklitsch, E. O..3142 Woodb'n, Cincinnati..Acad. of Med. of Cincinnati.
Pugh, F. H..... Bryan..Williams County Med. Soc.
Pugh, G. H.....Mt. Gilead..Morrow County Med. Soc.
Pumphrey, J. H.....Clayton..Montgomery Co. Med. Soc.
Purdy, Robt. W.....Bradyville..Adams County Med. Soc.
Purviance, Jos. F.....Steubenville..Jefferson County Med. Soc.
Pyle, John S.....2123 Ashland, Toledo..Acad. of Med. of Toledo and Lucas County.

Quayle, Chas. H..... Madison..Lake County Med. Soc.
Quinn, A. T.....Wilmington..Clinton County Med. Soc.
Quinn, H. S.....W. Jefferson..Madison County Med. Soc.
Quinn, J. L.....Eaton..Preble County Med. Soc.

Rachford, Benj. K..323 Br'dw'y, Cincinnati..Acad. of Med. of Cincinnati.
Ramroth, Robt. .....Marion..Marion County Med. Soc.
Ramsey, Allen.....Ortiz Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Ramsey, C. S.....King Bldg., Springfield..Clark County Med. Soc.
Ramsey, W. C.....Hopedale..Harrison County Med. Soc.
Ramsey, Wm. T.....Cambridge..Guernsey County Med. Soc.
Ranchous, W. E. M.,1273 N.High,Columbus..Columbus Acad. of Med.
Randall, C. G.....Harveysburg..Warren County Med. Soc.
Rankin, G. T.....Akron..Summit County Med. Soc.
Rankin, I. C.....Akron..Summit County Med. Soc.
Rankin, Theo. W...137 E. State, Columbus..Columbus Acad. of Med.
Rannells, D. A.....Logan..Hocking County Med. Soc.
Ranney, A. J., Lakeside Hospital, Cleveland..Acad. of Med. of Cleveland

Ranschoff, Jos.....706 Walnut, Cincinnati..Acad. of Med. of Cincinnati.
Rardin, Jos. S..... Portsmouth..Hempstead Acad. of Med.
Ratliff, Jos. M.....Huffman Hill, Dayton..Montgomery Co. Med. Soc.
Ratterman, B. J.....1532 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Ratterman, F. L.....4 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Rauch, E. P.....Lancaster..Fairfield County Med. Soc.
Rauschkolb, John.246 E. Fulton, Columbus..Columbus Acad. of Med.
Ravogli, A.....5 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Ray, James B.....Omega..Pike County Med. Soc.
Ray, James B.....Scioto..Scioto County Med. Soc.
Ray, V.....Groton Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Raye, Wm. L....Doan & Hulda, Cleveland..Acad. of Med. of Cleveland.
Rayel, K. J.....Galion..Gallia County Med. Soc.
Rea, E. H..... Irondale..Jefferson County Med. Soc.
Reamy, T. A., Life member,
619 Oak, Cincinnati..Acad. of Med. of Cincinnati.
Reason, Wm. .....Hilliard..Franklin County Med. Soc.
Reck, L. E..... Piqua..Miami County Med. Soc.
Reddin, F. O..... Hamler..Henry County Med. Soc.
Reed, Chas.A.L.,60 Groton Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Reed, R. C. S., Life member....Cincinnati..Acad. of Med. of Cincinnati.
Reed, Warren F.....Ottawa..Putnam County Med. Soc.
Reemelin, R. H.....36 W. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Reeve, Jno. C., Jr..3rd & Wilk'ns'n, Dayton..Montgomery Co. Med. Soc.
Reeve, John C., Life member.....Dayton..Montgomery Co. Med. Soc.
Regrish, G. C.....Defiance..Defiance County Med. Soc.
Reible, J. A.....504 N. Park, Columbus..Columbus Acad. of Med.
Reid, R. S..... Bucyrus..Crawford County Med. Soc.
Reilly, D. G.....2nd and Madison, Dayton..Montgomery Co. Med. Soc.
Reinhart, H. L.....Ironton..Lawrence County Med. Soc.
Remy, J. H.....Rockcamp..Lawrence County Med. Soc.
Remy, T. H.....Hanging Rock..Lawrence County Med. Soc.
Renneker, A. P..1602 Baymiller, Cincinnati..Acad. of Med. of Cincinnati.
Replogle, M. V.....Evansport..Defiance County Med. Soc.
Reynolds, J. F..874 Mt. Vernon, Columbus. Columbus Acad. of Med.
Reynolds, John J.....Defiance..Defiance County Med. Soc.
Rheil, John A.....Malvern..Carroll County Med. Soc.
Rhinehart, H. D.....Dayton..Montgomery Co. Med. Soc.
Rhodes, E. B.....3425 Euclid, Cleveland..Acad. of Med. of Cleveland.
Rhodes, O. A..... Salem..Columbiana Co. Med. Soc.
Rhodes, W. S.....Carbon Hill..Hocking County Med. Soc.
Rhoeten, W. A..... Mowreystown..Highland County Med. Soc.
Rhu, A. .....Marion..Marion County Med. Soc.
Rhu, H. S.....Marion..Marion County Med. Soc.

Rice, C. M.....Newton Falls..Trumbull County Med. Soc.
Rice, Robt. H.....Fremont..Sandusky County Med. Soc.
Richards, Alva .....New Lexington..Perry County Med. Soc.
Richards, J. B.....Ontario..Richland County Med. Soc.
Richards, N. D.....New Philadelphia..Tuscarawas Co. Med. Soc.
Richards, T. J. W.....New Philadelphia..Tuscarawas Co. Med. Soc.
Richardson, D. H.....Celina..Mercer County Med. Soc.
Richardson, E. O.....Marion..Marion County Med. Soc.
Richardson, J. V.....Fort Recovery..Mercer County Med. Soc.
Richardson, Wm. H.,2128 Euclid, Cleveland..Acad. of Med. of Cleveland.
Richardson, W. W.....Columbus..Columbus Acad. of Med.
Richeson, Carrie .....Bellefontaine..Logan County Med. Soc.
Ricker, Jos. W.....Cincinnati..Acad. of Med. of Cincinnati.
Ricketts, B. M...408 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Ricketts, E. S....408 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Rieg, Phil S.....338 Summit, Toledo..Acad. of Med. of Toledo and Lucas County.
Riegelhaupt, S.....659 Scovill, Cleveland..Acad. of Med. of Cleveland.
Riggs, J. U.....Bryan..Williams County Med. Soc.
Riley, J. A.....1314 Cedar, Cleveland..Acad. of Med. of Cleveland.
Rind, R. C...Press Rep. Bldg., Springfield..Clark County Med. Soc.
Rinehart, L. F.....New Lexington..Perry County Med. Soc.
Ringer, J. W.....Akron..Summit County Med. Soc.
Ritchie, Wm. J.....Warren..Trumbull County Med. Soc.
Robb, Hunter.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Robe, Orwin W.....Peebles..Adams County Med. Soc.
Roberds, Thos. W.....Bell..Highland County Med. Soc.
Roberts, A. C.....Morrow..Warren County Med. Soc.
Robertson, Jos. .....Steubenville..Jefferson County Med. Soc.
Robinson, A. .....Ironton..Lawrence County Med. Soc.
Rodebaugh, H. A...N. Park st., Columbus..Columbus Acad. of Med.
Rodgers, John H., Life member..Springfield..Clark County Med. Soc.
Roebuck, L. L.....Richwood..Union County Med. Soc.
Rogers, A.....W. Jefferson..Madison County Med. Soc.
Rogers, Geo. W.....Columbus..Columbus Acad. of Med.
Rogers, H. W.....128 Franklin, Cleveland..Acad. of Med. of Cleveland.
Rogers, I. .....Delaware..Delaware County Med. Soc.
Rogers, Wm. K....188 E. State, Columbus..Columbus Acad. of Med.
Rohrs, H. F.....Napoleon..Henry County Med. Soc.
Roller, G. W.....Lancaster..Fairfield County Med. Soc.
Romine, M. M.....Harveysburg..Warren County Med. Soc.
Root, E. B.....Painesville..Lake County Med. Soc.
Root, H. A.....417 Superior, Toledo..Acad. of Med. of Toledo and Lucas County.

Root, H. L.....Kinsman..Trumbull County Med. Soc.
Rose, T. W.....Port William..Clinton County Med. Soc.
Rosenberg, E. M.,1597 Woodland,Cleveland..Acad. of Med. of Cleveland.
Rosengrant, T. S.....Barnesville..Belmont County Med. Soc.
Rosenwasser, M..722 Woodland, Cleveland..Acad. of Med. of Cleveland.
Rosewater, M.....1351 Willson, Cleveland..Acad. of Med. of Cleveland.
Ross, C. C.....1447 Oak, Columbus..Columbus Acad. of Med.
Ross, C. H..... Dell Roy..Carroll County Med. Soc.
Ross, E. C.....Malvern..Carroll County Med. Soc.
Roth, Frank ..The Shelbourne, Cleveland..Acad. of Med. of Cleveland.
Rothenberg, Sam'l....32 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Rouly, J.....912 Clark, Cincinnati..Acad. of Med. of Cincinnati.
Rouse, W. L.....Painterfsville..Greene County Med. Soc.
Rowe, Jas. W..3514 Reading rd., Cincinnati..Acad. of Med. of Cincinnati.
Rowland, G. O.....E. Palestine..Columbiana Co. Med. Soc.
Rowles, T. H.....Akron..Summit County Med. Soc.
Rudy, Albert S..... Lima..Allen County Med. Soc.
Ruedy, Robt. E.....Noble road, Cleveland..Acad. of Med. of Cleveland.
Rulison, Ida B.....Cincinnati..Acad. of Med. of Cincinnati.
Rush, A. W.....Greenville..Darke County Med. Soc.
Rusk, R. P.....Cadiz..Harrison County Med. Soc.
Russ, H. A.....Hillsboro..Highland County Med. Soc.
Russell, Geo.C.,Williamson Bldg., Cleveland..Acad. of Med. of Cleveland.
Russell, John E.....Mt. Vernon..Knox County Med. Soc.
Rutter, H. C.....185 E. State, Columbus..Columbus Acad. of Med.
Ryan, Michael.....172 S. McClure, Dayton..Montgomery Co. Med. Soc.

Sabin, Thos. W.....Warren..Trumbull County Med. Soc
Sackett, W. A.....Akron..Summit County Med. Soc.
Saffin, Wilson .....Cincinnati..Acad. of Med. of Cincinnati.
Sager, B. E.....243 Crawford, Cleveland..Acad. of Med. of Cleveland.
Sager, H. W.....Marion..Marion County Med. Soc.
Sager, Jos. .....Celina..Mercer County Med. Soc.
Salisbury, Chas. W.,Brown & Green,Dayton..Montgomery Co. Med. Soc.
Salisbury, Jas. A.....N. Main, Dayton..Montgomery Co. Med. Soc.
Samson, H. M.....Lancaster..Fairfield County Med. Soc.
Samson, W. S.....Lancaster..Fairfield County Med. Soc
Sanders, A. F....Groton Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Sanford, H. L.....275 Prospect, Cleveland..Acad. of Med. of Cleveland.
Sanger, D. M.....Dayton..Montgomery Co. Med. Soc.
Sater, Clifford .....Cincinnati..Acad. of Med. of Cincinnati.
Sater, P. M.....Gratis..Preble County Med. Soc.
Sattler, E. E....109 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Sattler, Robt., Life member,
Groton Bldg., Cincinnati..Acad. of Med. of Cincinnati.

Saunders, O. H.....Findlay..Hancock County Med. Soc.
Savage, Thos. .....Xenia..Greene County Med. Soc.
Sawyer, C. H.....Mineral City..Tuscarawas Co. Med. Soc.
Sawyer, Chas. E.....Marion..Marion County Med. Soc.
Sawyer, F. B.....Marion..Marion County Med. Soc.
Sawyer, John P.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Sawyer, P. H.....54 Streator, Cleveland..Acad. of Med. of Cleveland.
Sayler, W. S.....Gratis..Preble County Med. Soc.
Schawakel, G. H....S. Front st., Columbus..Columbus Acad. of Med.
Scheibenzuber, D. .....228 Green, Dayton..Montgomery Co. Med. Soc.
Scheirer, F.....1812 Baymiller, Cincinnati..Acad. of Med. of Cincinnati.
Schenck, W. E....5 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Schierman, H. A.....Portsmouth..Hempstead Acad. of Med.
Schirack, J. A.....St. Henry..Mercer County Med. Soc.
Schmedter, W. C., 848 W. Liberty, Cincin'ti..Acad. of Med. of Cincinnati.
Schmidt, Theo. W...116 E. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Schmoldt, F. J....1696 Superior, Cleveland..Acad. of Med. of Cleveland.
Schnetzler, A. C...Hotel Madison, Toledo..Acad. of Med. of Toledo and Lucas County.
Schoeffle, H. C.....Sandusky..Erie County Med. Soc.
Schorr, P. E.....2203 Clifton, Cincinnati..Acad. of Med. of Cincinnati.
Schrickel, L. C....1631 Walnut, Cincinnati..Acad. of Med. of Cincinnati.
Schroeder, J. H..858 McMicken, Cincinnati..Acad. of Med. of Cincinnati.
Schrote, J. L.....Vanlue..Hancock County Med. Soc.
Schueller, E. W....465 S. High, Columbus..Columbus Acad. of Med.
Schultz, O. T....Charity Hosp., Cleveland..Acad. of Med. of Cleveland.
Schultzbach, J. C.....Strasburg..Tuscarawas Co. Med. Soc.
Schuster, Geo. R.....W. Fourth, Dayton..Montgomery Co. Med. Soc.
Schwab, L.....1649 Blue Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Schwagmeyer, A.....1909 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Schwartz, E. J.....Salem..Columbiana Co. Med. Soc.
Schwartz, W. F.....Auburn..Geauga County Med. Soc.
Scott, B. B.....Mt. Vernon..Knox County Med. Soc.
Scott, E. .....Columbus..Columbus Acad. of Med.
Scott, Frank .....Rogers..Columbiana Co. Med. Soc.
Scott, N. Stone...Citizens Bldg., Cleveland..Acad. of Med. of Cleveland.
Scott, Wm. .....Loveland..Clermont County Med. Soc.
Scoville, Jas. M.....Warren..Trumbull County Med. Soc.
Scully, Alfred P....220 Detroit, Cleveland..Acad. of Med. of Cleveland.
Sealover, Wm. F.....Zanesville..Muskingum Co. Med. Soc.
Seaman, W. M.....Delaware..Delaware County Med. Soc.
Seamans, E. M.....Delaware..Delaware County Med. Soc.
Searl, W. A.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.

Searl, W. A.....Cuyahoga Falls..Summit County Med. Soc.
Sears, O. T.....2136 Madison, Toledo..Acad. of Med. of Toledo and Lucas County.
Season, E. H.....2338 Euclid, Cleveland..Acad. of Med. of Cleveland.
Sechrist, C. S.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Seidel, R. R.....Bedford..Acad. of Med. of Cleveland.
Seiler, I. P.....Piketon..Pike County Med. Soc.
Seiler, J. H.....Akron..Summit County Med. Soc.
Sellards, A. G.....Portsmouth..Hempstead Acad. of Med.
Sellards, H. C.....Portsmouth..Hempstead Acad. of Med.
Selleck, S. L.....1448 Willson, Cleveland..Acad. of Med. of Cleveland.
Sellew, T. G.....Marietta..Washington Co. Med. Soc.
Seward, I. E.....172 Main, Springfield..Clark County Med. Soc.
Sewell, S. G.....Greenville..Darke County Med. Soc.
Seys, H. H.....City Bldg., Springfield..Clark County Med. Soc.
Shackelton, Wm.E.,Osborn Bldg.,Cleveland..Acad. of Med. of Cleveland.
Shalter, M.....Canal Dover..Tuscarawas Co. Med. Soc.
Shank, R. R.....Dayton..Montgomery Co. Med. Soc.
Shanley, E. B.....New Philadelphia..Tuscarawas Co. Med. Soc.
Shannon, R. M.....Piqua..Miami County Med. Soc
Sharkey, B. .....Middletown..Butler County Med. Soc.
Sharkey, Thos. D.....Hamilton..Butler County Med. Soc.
Sharpe, B. M.....Sidney..Shelby County Med. Soc.
Sharpe, John W.....McClure..Henry County Med. Soc.
Sharpe, R. J.....S. Parson ave., Columbus..Columbus Acad. of Med.
Sharpe, W. J.....1238 Dorr, Toledo..Acad. of Med. of Toledo and Lucas County.
Shattuck, Chas. ....Coal Grove..Lawrence County Med. Soc.
Shattuck, John .....Ironton..Lawrence County Med. Soc.
Shattuck, Wm. .....Coal Grove..Lawrence County Med. Soc.
Shaw, A. C.....Eaton..Preble County Med. Soc.
Shaw, Wm. E....2974 Colerain, Cincinnati..Acad. of Med. of Cincinnati.
Shay, O. D.....E. Liverpool..Columbiana Co. Med. Soc.
Sheibley, A. F.....Ottawa..Putnam County Med. Soc.
Shelby, C. D...St. Alexis Hosp., Cleveland..Acad. of Med. of Cleveland.
Sheldon, S. B.....Fivemile..Brown County Med. Soc.
Schellenberger, J. E.....Covington..Miami County Med. Soc.
Shelton, H. P.....Georgetown..Brown County Med. Soc.
Shepard, C. M...102 N. Fourth, Columbus..Columbus Acad. of Med.
Shepard, Chas J..1181 Neil ave., Columbus..Columbus Acad. of Med.
Shepard, D. O.....Barnesville..Belmont County Med. Soc.
Shepherd, A. F.....State Hosp., Dayton..Montgomery Co. Med. Soc.
Sherk, A. B.....Rawson..Hancock County Med. Soc.
Sherman, H. G.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.

Sherman, H. G.....Painesville..Lake County Med Soc.
Sherwood, H. A.....Warren..Trumbull County Med. Soc.
Sherwood, Thos. .....Waynesville..Warren County Med. Soc.
Shields, E. H.....5 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Shields, Percy....5 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Shirer, J. G.....Newark..Licking County Med. Soc.
Shirkey, U. S. L....1357 Lorain, Cleveland..Acad. of Med. of Cleveland.
Shriner, P. D.....329 S. Front, Columbus..Columbus Acad. of Med.
Shumaker, D. M.....West Bedford..Coshocton County Med. Soc.
Sickerman, A. .....Akron..Summit County Med. Soc.
Siegelstein, L. E..333 Woodland, Cleveland..Acad. of Med. of Cleveland.
Siffert, T. C.....New Comerstown..Tuscarawas Co. Med. Soc.
Sihler, C.....1 Franklin Court, Cleveland..Acad. of Med. of Cleveland.
Silbaugh, J. J.....Lancaster..Fairfield County Med. Soc.
Silver, D. R., Life member.....Sidney..Shelby County Med. Soc.
Simpson, D. G.....Warren..Trumbull County Med. Soc.
Simpson, L. B.....Radnor..Delaware County Med. Soc.
Singer, A. E.....Lewisburg..Preble County Med. Soc.
Singery, F. L.....Democracy..Knox County Med. Soc.
Singleton, Jno. B.....10 E. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Sinnett, Edwin, Life member.....Granville..Licking County Med. Soc.
Sippy, A. F.....Akron..Summit County Med. Soc.
Skeel, Arthur J.....1156 Pearl, Cleveland..Acad. of Med. of Cleveland.
Skeel, R. E.....785 Prospect, Cleveland..Acad. of Med. of Cleveland.
Skeels, W. .....Carrollton..Carroll County Med. Soc.
Skidmore, H. A.....W. Mansfield..Logan County Med. Soc.
Smedley, A. L.....Hamilton..Butler County Med. Soc.
Smigel, P. S....2086 Broadway, Cleveland..Acad. of Med. of Cleveland.
Smith, A. .....Pottersburg..Union County Med. Soc.
Smith, A. K.....Logan..Hocking County Med. Soc.
Smith, B. D.....901 W. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Smith, Chas. B.....Hillsboro..Highland County Med. Soc.
Smith, Chas. N.....234 Michigan, Toledo..Acad. of Med. of Toledo and Lucas County.
Smith, Chas. W.....Cleveland..Acad. of Med. of Cleveland.
Smith, D. B....315 The Arcade, Cleveland..Acad. of Med. of Cleveland.
Smith, E. C.....Ada..Hardin County Med. Soc.
Smith, E. O.....1223 Walnut, Cincinnati..Acad. of Med. of Cincinnati.
Smith, Eugene A.,726 E.Prospect, Cleveland..Acad. of Med. of Cleveland.
Smith, F. K.....Warren..Trumbull County Med. Soc.
Smith, F. W.....Union..Montgomery Co. Med. Soc.
Smith, Frank .....Lovett..Adams County Med. Soc.
Smith, Geo. S.....275 Prospect, Cleveland..Acad. of Med. of Cleveland.
Smith, H. A.....Marietta..Washington Co. Med. Soc.

Smith, H. H.....Oxford..Butler County Med. Soc.
Smith, H. M.....Delaware..Delaware County Med. Soc.
Smith, John M.....New Philadelphia..Tuscarawas Co. Med. Soc.
Smith, McK. .....Columbus..Columbus Acad. of Med.
Smith, M. L.....Urbana..Champaign Co. Med. Soc.
Smith, R. R.....East Liberty..Logan County Med. Soc.
Smith, R. W.....Spring Valley..Greene County Med. Soc.
Smith, W. S.....12 N. St. Marys, Dayton..Montgomery Co. Med. Soc.
Smith, Wm. M.....Tawawa..Shelby County Med. Soc.
Smith, Wm. W.....Portsmouth..Hempstead Acad. of Med.
Smoot, Chas. E.....Pemberton..Shelby County Med. Soc.
Snively, H. H.....1st & High, Columbus..Columbus Acad. of Med.
Snodgrass, J.....Kenton..Hardin County Med. Soc.
Snodgrass, W. C.....Kenton..Hardin County Med. Soc.
Snook, Chas. W.....Clarksville..Clinton County Med. Soc.
Snorf, H. A.....Greenville..Darke County Med. Soc.
Snow, L. B.....122 Euclid ave., Cleveland..Acad. of Med. of Cleveland.
Snow, M.....143 Clinton, Cleveland..Acad. of Med. of Cleveland.
Snyder, A. E.....Bryan..Williams County Med. Soc.
Snyder, A. L.....Bryan..Williams County Med. Soc.
Snyder, Daniel J., Life member.....Scio..Harrison County Med. Soc.
Snyder, G. C.....Moxahala..Perry County Med. Soc.
Snyder, J....King ave. & High, Columbus..Columbus Acad. of Med.
Snyder, W. H.....211 Ontario, Toledo..Acad. of Med. of Toledo and Lucas County.
Solar, F. M.....1741 W. Wood, Cincinnati..Acad. of Med. of Cincinnati.
Sollmann, I..W. R. U. Med. Dep.,Cleveland..Acad. of Med. of Cleveland.
Somerville, Geo. H..2549 B'dway,Cleveland..Acad. of Med. of Cleveland.
Souder, R. L.....Ada..Hardin County Med. Soc.
Souders, Sam'l .....Dean..Montgomery Co. Med. Soc.
Southard, J. Q.....Marysville..Union County Med. Soc.
Southgate, L.....38 Glen Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Soyer, Geo. P....Bridge & Park, Cleveland..Acad. of Med. of Cleveland.
Spahr, D. E.....Clifton..Greene County Med. Soc.
Sparger, H. B.....Cincinnati..Acad. of Med. of Cincinnati.
Spear, R. C.....Mt. Gilead..Morrow County Med. Soc.
Speer, A. T.....Newark..Licking County Med. Soc.
Speidel, C. G..126 E. McMillan, E. Cincin'ti..Acad. of Med. of Cincinnati.
Spence, A. B.....So. Lebanon..Warren County Med. Soc.
Spence, D. W.....12 King Blk., Springfield..Clark County Med. Soc.
Spence, H. L.....1160 Madison, Cleveland..Acad. of Med. of Cleveland.
Spence, W. S.....Germano..Harrison County Med. Soc.
Spenzer, Jno. G.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Spitler, E. W.....Center..Montgomery Co. Med. Soc.

Spohr, Carl L.....464 S. High, Columbus..Columbus Acad. of Med.
Sprague, M. C.....Summerford..Madison County Med. Soc.
Spratt, W. R.....Malvern..Carroll County Med. Soc.
Sproull, O. T.....West Union..Adams County Med. Soc.
Spurney, A. B..141 S.Woodland, Cleveland..Acad. of Med. of Cleveland.
Spurney, A. F....864 Woodland, Cleveland..Acad. of Med. of Cleveland.
St. John, C. S.....Bowling Green..Wood County Med. Soc.
Stacy, S. .....Coshocton..Coshocton Co. Med. Soc.
Stafford, F. P.....New Carlisle..Clark County Med. Soc.
Stage, A. L.....Town st., Columbus..Columbus Acad. of Med.
Stamm, John .....Jacksonville..Athens County Med. Soc.
Stamm, M. .....Fremont..Sandusky County Med. Soc.
Stansell, Jos. A., Life member.....Forest..Hardin County Med. Soc.
Stanton, B.....931 Dayton, Cincinnati..Acad. of Med. of Cincinnati.
Stapleford, A. D., 2647 Western, Cincinnati..Acad. of Med. of Cincinnati.
Stark, O. W.....11½ E. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Stark, S.....11½ E. 8th, Cincinnati..Acad. of Med. of Cincinnati.
Starner, A. A.....Galion..Crawford County Med. Soc.
Steden, J. H.....Newark..Licking County Med. Soc.
Steel, J. H.....Guyville..Athens County Med. Soc.
Steel, Robt. G.....Melmore..Seneca County Med. Soc.
Stein, Geo. S.....820 S. High, Columbus..Columbus Acad. of Med.
Steiner, A.....Osborn Bldg., Cleveland..Acad. of Med. of Cleveland.
Steiner, D. W.....Lima..Allen County Med. Soc.
Steiner, I. F.....Lima..Allen County Med. Soc.
Steiner, Oliver .....Lima..Allen County Med. Soc.
Steinfeld, A. M..72 Parson ave., Columbus..Columbus Acad. of Med.
Steinfield, A. L.....228 Indiana, Toledo..Acad. of Med. of Toledo and Lucas County.
Steinwalt, Wm. L.....Fremont..Sandusky County Med. Soc.
Stephen, Jos. E.....Fort Jennings..Putnam County Med. Soc.
Stephens, C. A.....Helena..Sandusky County Med. Soc.
Stephens, G. I.....Greenville..Darke County Med. Soc.
Stephenson, Robt. A.....Manchester..Adams County Med. Soc.
Stephenson, T. .....Cherryfork..Adams County Med. Soc.
Stephenson, Y. .....Georgetown..Brown County Med. Soc.
Stepp, M. D.....7 Minnesota, Cleveland..Acad. of Med. of Cleveland.
Stern, W. G.....516 Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Steuber, F. G.....Lima..Allen County Med. Soc.
Steuber, L. J.....Lima..Allen County Med. Soc.
Steuer, D. B.....465 St. Clair, Cleveland..Acad. of Med. of Cleveland.
Steuer, Jos. C.....3 Woodland, Cleveland..Acad. of Med. of Cleveland.
Stevens, E. S.....Lebanon..Warren County Med. Soc.
Stevens, H. J.....Lilly Chapel..Madison County Med. Soc.

Stevens, Jno. L.....Mansfield..Richland County Med. Soc.
Stevens, M. B.....Defiance..Defiance County Med. Soc.
Stevenson, Geo. W..180 Oakdale, Cleveland..Acad. of Med. of Cleveland.
Stevenson, Jno. W..3rd-Kilgour,Cincinn'ti..Acad. of Med. of Cincinnati.
Stevenson, M. D.....Akron..Summit County Med. Soc.
Stewart, C. E.....2203 Lawrence, Toledo..Acad. of Med. of Toledo and Lucas County.
Stewart, D. G.....Black Fork..Lawrence County Med. Soc.
Stewart, E. A.....135 W. 5th, Dayton..Montgomery Co. Med. Soc.
Stewart, J. O.....Cedarville..Greene County Med. Soc.
Stewart, J. S.....Mansfield..Richland County Med. Soc.
Stewart, Jas. M.....Fremont..Sandusky County Med. Soc.
Stewart, Robt. W...Ortiz Bldg., Cincinnati..Acad. of Med. of Cincinnati.
Stewart, Wm. D.....234 Michigan, Toledo..Acad. of Med. of Toledo and Lucas County.
Stillman, F. L.....118 E. Broad, Columbus..Columbus Acad. of Med.
Stinchcomb, W. G.....Bellefontaine..Logan County Med. Soc.
Stockton, Geo.....State Hosp., Columbus..Columbus Acad. of Med.
Stockton, L. D.....Carrollton..Carroll County Med. Soc.
Stokes, C. C.....Bellefontaine..Logan County Med. Soc.
Stoll, C. W.....Dover..Acad. of Med. of Cleveland.
Stoneburner, W. F.....Moxahala..Perry County Med. Soc.
Storz, C.....524 Nebraska, Toledo..Acad. of Med. of Toledo and Lucas County.
Stoskopf, Geo.....640 Jennings, Cleveland..Acad. of Med. of Cleveland.
Stotter, J.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Stout, J. J.....Luhrig..Athens County Med. Soc.
Stovering, F. A....334 Pearl st., Cleveland..Acad. of Med. of Cleveland.
Straehley, E. O.....812 Dayton, Cincinnati..Montgomery Co. Med. Soc.
Straight, H. S..321 Hickox Bldg.,Cleveland..Acad. of Med. of Cleveland.
Strain, A. J.....London..Madison County Med. Soc.
Strickler, L.....55 Groton, Cincinnati..Acad. of Med. of Cincinnati.
Stuart, Chas. C....408 Jennings, Cleveland..Acad. of Med. of Cleveland.
Stubbs, W. C.....Celina..Mercer County Med. Soc.
Stucky, F. P.....Lancaster..Fairfield County Med. Soc.
Stucky, J. M.....Lancaster..Fairfield County Med. Soc.
Sturgeon, J.....Leetonia..Columbiana Co. Med. Soc.
Sturgiss, H. G.....Lower Salem..Washington Co. Med. Soc.
Suchy, F. H..Bert'm & Central, Cleveland..Acad. of Med. of Cleveland.
Sulzer, G. A.....Portsmouth..Hempstead Acad. of Med.
Sunkle, R. H.....Pearl & Clark, Cleveland..Acad. of Med. of Cleveland.
Sutter, F. R.....Shelby..Richland County Med. Soc.
Sutton, H. T.....Zanesville..Muskingum Co. Med. Soc.
Swartsel, S. C....1786 Elmore, Cincinnati..Acad. of Med. of Cincinnati.
Swisher, A. B.....Marysville..Union County Med. Soc.

Sykora, Jos.....1449 Broadway, Cleveland..Acad. of Med. of Cleveland.
Symons, J. P.....Rockford..Mercer County Med. Soc.
Symons, L. L.....Springfield..Clark County Med. Soc.

Tachauer, A.....208 S. Jefferson, Dayton..Montgomery Co. Med. Soc.
Taggart, H. D.....Akron..Summit County Med. Soc.
Tait, P. G.....514 Adams, Toledo..Acad. of Med. of Toledo and Lucas County.
Talley, C. F.....Powell..Delaware County Med. Soc.
Talmage, J. B.....Columbiana..Columbiana Co. Med. Soc.
Tangeman, Chas. W..20 W. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Tappan, P. W.....State Hosp., Dayton..Montgomery Co. Med. Soc.
Tarbell, Robt. C..112 E. Broad, Columbus..Columbus Acad. of Med.
Tarr, Robt. T.....Broadway, Cleveland..Acad. of Med. of Cleveland.
Tate, M. A.....361 E. 3rd, Cincinnati..Acad. of Med. of Cincinnati.
Tate, Ralph B.....361 E. 3rd, Cincinnati..Acad. of Med. of Cincinnati.
Tauber, E. B.....19 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Taylor, C. M.....1072 N. High, Columbus..Columbus Acad. of Med.
Taylor, F. C.....128 Franklin, Cleveland..Acad. of Med. of Cleveland.
Taylor, Jas. L.....Wheelersburg..Scioto County Med. Soc.
Taylor, L. L.....Yellow Spring..Greene County Med. Soc.
Taylor, Martin .....Ft. Recovery..Mercer County Med. Soc.
Taylor, S. B.....344 E. Rich st., Columbus..Columbus Acad. of Med.
Taylor, Van D..2913 Woodburn, Cincinnati..Acad. of Med. of Cincinnati.
Taylor, W. H.....553 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Taylor, W. J.....141 W. Fourth, Dayton..Montgomery Co. Med. Soc.
Taylor, Wm. J.....E. Liverpool..Columbiana Co. Med. Soc.
Taylor, Wm. J.....553 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Teachnor, W.....187 E. State, Columbus..Columbus Acad. of Med.
Telfair, G. M.....Bloomingburg..Fayette County Med. Soc.
Tennell, J. B.....Piqua..Miami County Med. Soc.
Terwilliger, T. R.....Lima..Allen County Med. Soc.
Test, A. L.....Portsmouth..Hempstead Acad. of Med.
Theiss, G. A.....Akron..Summit County Med. Soc.
Theiss, H. C.....Akron..Summit County Med. Soc.
Thomas, Benj. A.....Rushville..Brown County Med. Soc.
Thomas, Geo. F.....Peebles..Adams County Med. Soc.
Thomas, J. D.....Catawba..Clark County Med. Soc.
Thomas, J. L. .....Akron..Summit County Med. Soc.
Thomas, Jno. J...156 Crawford, Cleveland..Acad. of Med. of Cleveland.
Thomas, John M.....Ohio Pen., Columbus..Columbus Acad. of Med.
Thomas, O. H.....Fremont..Sandusky County Med. Soc.
Thomas, O. T.....50 Euclid, Cleveland..Acad. of Med. of Cleveland.
Thomas, T. R.....Lima..Allen County Med. Soc.

Thompson, E. H..11 W. Fourth, Cincinnati..Acad. of Med. of Cincinnati.
Thompson, F. E.....Marengo..Morrow County Med. Soc.
Thompson, F. S.....1514 E. 3rd, Dayton..Montgomery Co. Med. Soc.
Thompson, H. W.....Salem..Columbiana Co. Med. Soc.
Thompson, J. A.....628 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Thompson, W. E.....Bethel..Clermont County Med. Soc.
Thompson, W. R.....Troy..Miami County Med. Soc.
Thorn, Sam'l S., Life member, LaGrange, Toledo..Acad. of Med. of Toledo and Lucas County.
Thrasher, A. B..65 Groton Bldg.,Cincinn'ti..Acad. of Med. of Cincinnati.
Thrasher, W. W.,65 Groton Bldg., Cincin'ti..Acad. of Med. of Cincinnati.
Tichenor, E. J., Life member.....Lebanon..Warren County Med. Soc.
Tidd, E. W.....Stockdale..Pike County Med. Soc.
Tierney, John S.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Timberman, A. J..112 E. Broad, Columbus..Columbus Acad. of Med.
Tinker, K. T.....Athens..Athens County Med. Soc.
Tischbein, F. J.....635 Delhi, Cincinnati..Acad. of Med. of Cincinnati.
Titlow, B. D.....129 E. High, Springfield..Clark County Med. Soc.
Tobey, H. A.....State Hospital, Toledo..Acad. of Med. of Toledo and Lucas County.
Tobias, E. H.....Bowling Green..Wood County Med. Soc.
Todd, G. M.....Akron..Summit County Med. Soc.
Toot, Jos. E. .....E. Liverpool..Columbiana Co. Med. Soc.
Topmoeller, Jos. M...823 Bank, Cincinnati..Acad. of Med. of Cincinnati.
Torrence, Jno. .....Hamilton..Butler County Med. Soc.
Towslee, L. G.....275 Prospect, Cleveland..Acad. of Med. of Cleveland.
Traul, A. D.....Galion..Crawford County Med. Soc.
Travis, Jno. L.....Germantown..Montgomery Co. Med. Soc.
Tribett, C. A.....Westboro..Clinton County Med. Soc.
Trickle, E. H.....Cutler..Washington Co. Med. Soc.
Trimble, Chas. E.....Crestline..Crawford County Med. Soc.
Trimble, R. H.....Mt. Sterling..Madison County Med. Soc.
Trimble, R. T.....New Vienna..Clinton County Med. Soc.
Trimmer, E. L.....E. Liverpool..Columbiana Co. Med. Soc.
Tritch, John C.....Findlay..Hancock County Med. Soc.
Trush, J.....437 E. 3rd, Cincinnati..Acad. of Med. of Cincinnati.
Tucker, E. D.....709 Madison, Toledo..Acad. of Med. of Toledo and Lucas County.
Tucker, N. .....Mt. Gilead..Morrow County Med. Soc.
Tuckerman, J. E....298 Central, Cleveland..Acad. of Med. of Cleveland.
Tunison, I. F.....436 E. 5th., Cincinnati..Acad. of Med. of Cincinnati.
Tupper, E. L.....Ottawa..Putnam County Med. Soc.
Turner, Chas. E....Mt. Vernon, Columbus..Columbus Acad. of Med.
Turner, L. B.....Bidwell..Gallia County Med. Soc.

Turney, Chas. F....Mt. Vernon, Columbus..Columbus Acad. of Med.
Twitchell, Geo. B..1616 Freeman,Cincinnati..Acad. of Med. of Cincinnati.
Tydings, O. .....Piqua..Miami County Med. Soc.
Tyler, Geo. P.....Ripley..Brown County Med. Soc.

Uberroth, M. W.....New Riegel..Seneca County Med. Soc.
Uhler, H. L.....Marion..Marion County Med. Soc.
Underwood, E. S.....Akron..Summit County Med. Soc.
Unkefer, W. N.....Piqua..Miami County Med. Soc.
Updegraff, R. K....1129 Detroit, Cleveland..Acad. of Med. of Cleveland.
Upham, Jno. H. J..112 E. Broad, Columbus..Columbus Acad. of Med.
Upson, Geo. D....Hickox Bldg., Cleveland..Acad. of Med. of Cleveland.
Upson, H. S..514 New England, Cleveland..Acad. of Med. of Cleveland.
Ury, John B.....Defiance..Defiance County Med. Soc.

Vail, D. T.....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Vail, J. B.....Lima..Allen County Med. Soc.
Vance, A. H.....85 E. High, Springfield..Clark County Med. Soc.
Vandervoort, J. W., Life member,
Harveysburg..Warren County Med. Soc.
Van Fossen, J. M.....E. Palestine..Columbiana Co. Med. Soc.
Van Horn, G. S.....Batavia..Clermont County Med. Soc.
Van Meter, C. B..2941 Colerain, Cincinnati..Acad. of Med. of Cincinnati.
Van Netta, E.....Fultonham..Muskingum Co. Med. Soc.
Van Note, Wm. B.....Lima..Allen County Med. Soc.
Van Pelt, Chas. L...1819 Jefferson, Toledo..Acad. of Med. of Toledo and Lucas County.
Van Winkle, N. B.....Blanchester..Clinton County Med. Soc.
Varney, J. D.....Chesterville..Morrow County Med. Soc.
Varnum, J. H.....Benton Ridge..Hancock County Med. Soc.
Vaughan, N. C..2633 Park ave., Cincinnati..Acad. of Med. of Cincinnati.
Vermilya, E. L.....Fremont..Sandusky County Med. Soc.
Vermilya, O. C.....Fremont..Sandusky County Med. Soc.
Vincent, H. D.....499 Pearl st., Cleveland..Acad. of Med. of Cleveland.
Virture, D. B.....Iberia..Morrow County Med. Soc.
Von Muralt, R. .....Tiltonsville..Jefferson County Med. Soc.
Vorhees, B. C.....Albany..Athens County Med. Soc.
Vorhees, E. E.....Cambridge..Guernsey County Med. Soc.

Wagar, Chas. P.....450 Spitzer, Toledo..Acad. of Med. of Toledo and Lucas County.
Wagner, H. G.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Wagner, H. M.....Newark..Licking County Med. Soc.
Wagner, P. M.....Canal Dover..Tuscarawas Co. Med. Soc.

Wakefield, J. D.....Loveland..Clermont County Med. Soc.
Walker, Chas. S.,Prosp. & Willson, Clevel'd..Acad. of Med. of Cleveland.
Walker, E. W....30 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Walker, T. W.....Steubenville..Jefferson County Med. Soc.
Walker, W. H.....Wattsville..Carroll County Med. Soc.
Wallace, John .....Deersville..Harrison County Med. Soc.
Warburton, G. .....Zanesville..Muskingum Co. Med. Soc.
Ward, C. S.....Warren..Trumbull County Med. Soc.
Ward, Chas. E....378 Jennings, Cleveland..Acad. of Med. of Cleveland.
Ward, J. W.....Lytle..Warren County Med. Soc.
Ward, Jos. .....Cortland..Trumbull County Med. Soc.
Wardlow, Y.....120 E. Broad, Columbus..Columbus Acad. of Med.
Warner, F.....Park Hotel, Columbus..Columbus Acad. of Med.
Warner, W. C.....739 Hough, Cleveland..Acad. of Med. of Cleveland.
Warren, Wm. S.....Businessburg..Belmont County Med. Soc.
Warren, W. W.....Newport..Washington Co. Med. Soc.
Warwick, Jno. B.....Lucasville..Scioto County Med. Soc.
Wasson, C. C.....Hamilton..Butler County Med. Soc.
Waters, Geo. M..Park & Buttles, Columbus..Columbus Acad. of Med.
Waters, P. F.....Chattanooga..Mercer County Med. Soc.
Watson, Jas. L.....420 Superior, Toledo..Acad. of Med. of Toledo and Lucas County.
Watson, Jos.....214 Eastern, Cincinnati..Acad. of Med. of Cincinnati.
Watt, John W.....Toronto..Jefferson County Med. Soc.
Watterson, B. E.....Continental..Putnam County Med. Soc.
Waugh, J. M.....3584 Euclid, Cleveland..Acad. of Med. of Cleveland.
Weadock, E. G.....Lima..Allen County Med. Soc.
Weamer, P. F.....Coldwater..Mercer County Med. Soc.
Wean, C. B.....Lorain..Lorain County Med. Soc.
Weatherhead,D.E.,77 Groton Bldg.,Cincin'ti..Acad. of Med. of Cincinnati.
Weaver, B. W.....Cincinnati..Acad. of Med. of Cincinnati.
Weaver, F. C.....226 W. Fourth, Dayton..Montgomery Co. Med. Soc.
Weaver, Jas. M., Life member, 111 S. Ludlow, Dayton..Montgomery Co. Med. Soc.
Weaver, W. B...32 Garfield pl., Cincinnati..Acad. of Med. of Cincinnati.
Weaver, Wm. P.....Miamisburg..Montgomery Co. Med. Soc.
Webb, A. G.....413 Broadway, Cincinnati..Acad. of Med. of Cincinnati.
Webb, D.....2611 Vine, Cincinnati..Acad. of Med. of Cincinnati.
Weber, John H..Charity Hosp., Cleveland..Acad. of Med. of Cleveland.
Weber, Wm. C.....Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Webster, Chas. L...E. Prospect, Cleveland..Acad. of Med. of Cleveland.
Webster, Sam'l J.....S. Brooklyn..Acad. of Med. of Cleveland.
Wedler, C. R....St. Clair Hosp., Cleveland..Acad. of Med. of Cleveland.
Weeks, D. O.....Marion..Marion County Med. Soc.

Weeks, E. A.....Akron..Summit County Med. Soc.
Wegar, Geo. S.....Delphos..Allen County Med. Soc.
Weir, Wm. H.....260 Euclid, Cleveland..Acad. of Med. of Cleveland.
Weitz, J. A.....Montpelier..Williams County Med. Soc.
Welch, A. J.....Summit Station..Licking County Med. Soc.
Welch, A. J.....Mt. Sterling..Madison County Med. Soc.
Weller, J. N.....Akron..Summit County Med. Soc.
Wellons, J. W.....112 E. Broad, Columbus..Columbus Acad. of Med.
Wells, C. H.....Summit Station..Licking County Med. Soc.
Wells, E. E.....Ironton..Lawrence County Med. Soc.
Welsh, E. E.....Eaton..Preble County Med. Soc.
Welsh, Ella .....Ashley..Delaware County Med. Soc.
Wendel, H. C....509 McMicken, Cincinnati..Acad. of Med. of Cincinnati.
Wenner, H. L.....Tiffin..Seneca County Med. Soc.
Wenning, Wm. H...722 Laurel, Cincinnati..Acad. of Med. of Cincinnati.
Werthner, Jos.....1108 S. Wayne, Dayton..Montgomery Co. Med. Soc.
West, F. D.....Tiffin..Seneca County Med. Soc.
West, John D.....Hopedale..Harrison County Med. Soc.
West, J. P.....Bellaire..Belmont County Med. Soc.
West, Sam'l L.....St. Clairsville..Belmont County Med. Soc.
Westrick, J. D.....Defiance..Defiance County Med. Soc.
Wheatley, W. E.....Lorain..Lorain County Med. Soc.
Wheeler, A. W.....Superior, Toledo..Acad. of Med. of Toledo and Lucas County.
Wheeler, H. S.....Niles..Trumbull County Med. Soc.
Wheelock, L. A.....2 Hazel st., Cleveland..Acad. of Med. of Cleveland.
Whisler, H.....New Antioch..Clinton County Med. Soc.
Whitacre, H. J....2120 Auburn, Cincinnati..Acad. of Med. of Cincinnati.
Whitacre, M.....2120 Auburn, Cincinnati..Acad. of Med. of Cincinnati.
Whitaker, H. W....72 S. Grant, Columbus..Columbus Acad. of Med.
White, Chas. C.....Mineral City..Tuscarawas Co. Med. Soc.
White, J. M.....Ironton..Lawrence County Med. Soc.
White, U. P.....Athens..Athens County Med. Soc.
White, W. F.....Marysville..Union County Med. Soc.
Whitehead, H....230 W. Broad, Columbus..Columbus Acad. of Med.
Whiteleather, T. B.....Malvern..Carroll County Med. Soc.
Whitmar, E. A..588 Mt. Vernon, Columbus..Columbus Acad. of Med.
Whitslar, W. H..Schofield Bldg., Cleveland..Acad. of Med. of Cleveland.
Wiant, C. T.....Marion..Marion County Med. Soc.
Wickerham, Jas. O.....Seaman..Adams County Med. Soc.
Wideman, E. M..Det. & Highl'd, Cleveland..Acad. of Med. of Cleveland.
Wikoff, A. A.....Decatur..Brown County Med. Soc.
Wilcox, S. S.....173 E. State, Columbus..Columbus Acad. of Med.
Willard, G. P.....Tiffin..Seneca County Med. Soc.

Willard, Geo. W.....114 N. 5th, Columbus..Columbus Acad. of Med.
Willey, A. J.....Delaware..Delaware County Med. Soc.
Willey, P. M.....Lewis Center..Delaware County Med. Soc.
Williams, B. O.....Martins Ferry..Belmont County Med. Soc.
Williams, C. C.....Niles..Trumbull County Med. Soc.
Williams, Chas. D.....Cleveland..Acad. of Med. of Cleveland.
Williams, D. A.....Franklin..Warren County Med. Soc.
Williams, F. H.....Portsmouth..Hempstead Acad. of Med.
Williams, G. H.....Columbus..Columbus Acad. of Med.
Williams, J. R.....Carrollton..Carroll County Med. Soc.
Williams, Jno. G.....Cheviot..Acad. of Med. of Cincinnati.
Williams, M. L.....Warren..Trumbull County Med. Soc.
Williams, M. R.....903 Elm, Cincinnati..Acad. of Med. of Cincinnati.
Williams, T. B.....145 Quincy, Cleveland..Acad. of Med. of Cleveland.
Williamson, A. M.,B'dway & Amity,Dayton..Montgomery Co. Med. Soc.
Williamson, J. C.....Sciotoville..Scioto County Med. Soc.
Williamson, J. H.....Higginsport..Brown County Med. Soc.
Willis, O. M.....Marietta..Washington Co. Med. Soc.
Wills, W. H.....Milford Center..Union County Med. Soc.
Willson, Chas. H.....Idaho..Pike County Med. Soc.
Willson, Wm. H., Life member..Greenfield..Highland County Med. Soc.
Wilson, D. C., Life member.....Ironton..Lawrence County Med. Soc.
Wilson, Dale.....427 Euclid, Toledo..Montgomery Co. Med. Soc.
Wilson, E. J.....113 E. Broad, Columbus..Columbus Acad. of Med.
Wilson, E. M.....Burlington..Lawrence County Med. Soc.
Wilson, F. L.....So. Solon..Madison County Med. Soc.
Wilson, F. P.....427 Euclid, Toledo..Montgomery Co. Med. Soc.
Wilson, J. G.....Colerain..Belmont County Med. Soc.
Wilson, Jno. B...206 E. Fourth, Cincinnati..Acad. of Med. of Cincinnati.
Wilson, M. .....Athens..Athens County Med. Soc.
Wilson, M. B.....London..Madison County Med. Soc.
Wilson, R. A.....Dennison..Tuscarawas Co. Med. Soc.
Wilson, S. R.....Celina..Mercer County Med. Soc.
Wilson, S. S.....Xenia..Greene County Med. Soc.
Wilson, T. S.....Findlay..Hancock County Med. Soc.
Winans, J. V.....Madison..Lake County Med. Soc.
Winders, Frank..The Lexington, Columbus..Columbus Acad. of Med.
Winn, Geo. E.....Evansport..Defiance County Med. Soc.
Winn, T. T.....Norwood..Acad. of Med. of Cincinnati.
Wintermute, J. C.....Celina..Mercer County Med. Soc.
Winters, B. E.....Shawnee..Perry County Med. Soc.
Winton, Chas.....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Wire, Geo. W.....Wilmington..Clinton County Med. Soc.
Wise, L. J.....Akron..Summit County Med. Soc.

Wise, W. D.....Medina..Medina County Med. Soc.
Wiseman, Jno. S.....Beaver..Pike County Med. Soc.
Witham, F. P.....Withamsville..Clermont County Med. Soc.
Witham, J. E.....King Mills..Warren County Med. Soc.
Withrow, Jno. M....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Wittenmyer, J. M.....Peebles..Adams County Med. Soc.
Wittick, R. B.....Mt. Sterling..Madison County Med. Soc.
Wittkamp, T. M...1437 Walnut, Cincinnati..Acad. of Med. of Cincinnati.
Wolf, E. A.....Dennison..Tuscarawas Co. Med. Soc.
Wolf, Jno. H.....Degraff..Logan County Med. Soc.
Wolfe, A. C.....35 W. 4th ave., Columbus..Columbus Acad. of Med.
Wolfstein, D. I.....22 W. 7th, Cincinnati..Acad. of Med. of Cincinnati.
Wood, J. M.....Hepburn..Hardin County Med. Soc.
Wood, J. N.....Mt. Gilead..Morrow County Med. Soc.
Wood, Jno. S.....Collinwood..Acad. of Med. of Cleveland.
Wood, O. S.....Haydenville..Hocking County Med. Soc.
Wood, Wm. H..526 Rose Bldg., Cleveland..Acad. of Med. of Cleveland.
Wood, Wm. R.....Smithfield..Jefferson County Med. Soc.
Woodard, H.....Oak Harbor..Ottawa County Med. Soc.
Woodford, E. W., 737 Detroit st., Cleveland..Acad. of Med. of Cleveland.
Woodlin, W. J.,698½ Mt. Vernon,Columbus..Columbus Acad. of Med.
Woodruff, L., Life member.....Alton..Franklin County Med. Soc.
Woods, E.....305 Wayne, Toledo..Acad. of Med. of Toledo and Lucas County.
Woods, Jos. T., Life member,
459 P st. N. W., Washington, D. C.
Woods, L. S.....Rawson..Hancock County Med. Soc.
Woodward, H. L.....Cincinnati..Acad. of Med. of Cincinnati.
Woodward, W. G...108 W. 9th, Cincinnati..Acad. of Med. of Cincinnati.
Woodworth, J. B.....Delaware..Delaware County Med. Soc.
Woodworth, W. H.....Delaware..Delaware County Med. Soc.
Woolgar, W. J. W...1444 Cedar, Cleveland..Acad. of Med. of Cleveland.
Wray, K.....222 N. 18th, Columbus..Columbus Acad. of Med.
Wright, A. T.....Blue Ball..Butler County Med. Soc.
Wright, E. M.....Warsaw..Coshocton Co. Med. Soc.
Wright, F. O.....Wilmington..Clinton County Med. Soc.
Wright, G. M.....Liberty Center..Delaware County Med. Soc.
Wright, J. M. M.....Red Lion..Warren County Med. Soc.
Wright, Jas. H.....New Lexington..Perry County Med. Soc.
Wright, Jno. A.....1812 Cherry, Toledo..Acad. of Med. of Toledo and Lucas County.
Wright, Jno. W.....39 E. Long, Columbus..Columbus Acad. of Med.
Wright, S. J.....Akron..Summit County Med. Soc.
Wright, T. M.....Troy..Miami County Med. Soc.